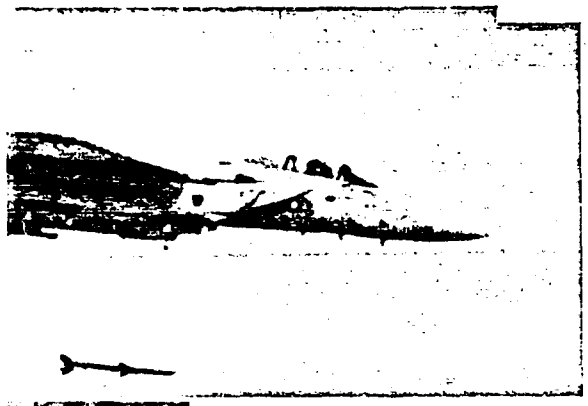
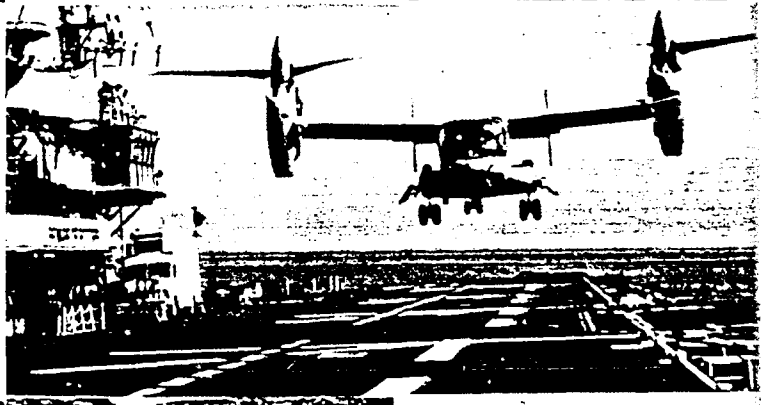
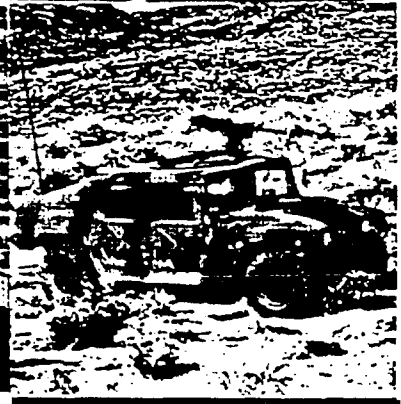
JOINT LOGISTICS COMMANDERS' GUIDE FOR THE MANAGEMENT OF JOINT SERVICE PROGRAMS

A HANDBOOK FOR MANAGERS ENTERING THE WORLD OF MULTI-SERVICE SYSTEMS ACQUISITION







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1. AMRAAM
2. STINGER
3. M1A1 120 MM GUN
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6. HUMMWV
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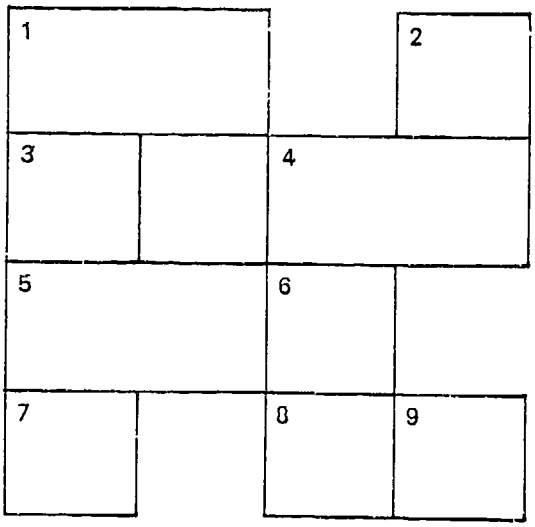

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This update of the June 1982 Guide was prepared under the sponsorship of the Joint Logistics Commanders and the auspices of the Policy and Organization Management Department, Defense Systems Management College. The guide's goal is to provide newly assigned managers of joint programs and their staffs with an understanding of the nature of joint programs, how they differ from single-service programs, and which aspects of program management demand greater emphasis than normally accorded single-service programs. This revision includes two additional chapters: one pertaining to security, and the other on successful programs and lessons learned. The guide also contains a number of appendices of relevant material including a listing of joint service programs. Keywords:

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Joint Logistics Commanders' Guide for

THE MANAGEMENT OF JOINT SERVICE PROGRAMS

3rd Edition - 1987

A Handbook for Managers Entering the World of Multiservice Systems Acquisition

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FOREWORD

Managing Joint Service Programs is a great challenge for professionals in the field of acquisition in the 80's. Effective joint program management necessitates an understanding of each of the services' missions and operational needs as well as the differences in their acquisition approaches. Amalgamating the system acquisition needs of two or more military services under the charter of a Joint Program Office and successfully delivering the system on time and within budget requires exceptional managerial skills.

The Joint Logistics Commanders have sponsored this guide, as an aid to understanding Joint Service Program Management. The acquisition field has always been dynamic. Recent enactment of Public Law 99-348 which created the Office of the Under Secretary of Defense for Acquisition is an example. Accordingly, this guide will continue to require periodic updating and the Commandant, Defense Systems Management College has assumed this responsibility. Proposed changes or additions to this guide should be forwarded to: Commandant, Defense Systems Management College, Attn: Research Directorate, Fort Belvoir,Virginia 22060-5426.

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PREFACE

The continuing evolution and restructuring of the Department of Defense (DoD) acquisition domain dictate the need for periodically updating this guide. Accordingly, this third edition of the guide updates the references to DoD, JLC, and service guidance pertaining to or relevant to the management of Joint Service Programs.

This update of the guide was prepared under the sponsorship of the Joint Logistics Commanders and the auspices of the Research Directorate, Defense Systems Management College. The guide's goal is to provide newly assigned managers of joint programs and their staffs with an understanding of the nature of joint programs, how they differ from single-service programs, and which aspects of program management demand greater emphasis than normally accorded single-service programs. This revision includes two additional chapters; one pertaining to security and the other to successful programs and lessons learned. The guide also contains a number of appendices of relevant material including a listing of joint service programs. The guide is limited to US multiservice programs. Further, it is assumed that the reader is trained or experienced in the field of military systems acquisition management.

Information and data for this guide update were provided by numerous personnel and sources throughout the DoD and other sources. In addition, special recognition is given to Cdr. Lawrence M. Kost, USN, Professor of Acquisition Management, Defense Systems Management College (DSMC), for the generous amounts of time he contributed to the reviews of this guide during its development. Likewise, the review efforts of numerous other DSMC staff members are also acknowledged, as are the coordinating efforts of the JLC Secretariats.

The appendices contain examples of pertinent references, a listing of Joint Service Programs, and a glossary which primarily contains terms and definitions applicable to Joint Programs.

Due to the dynamic environment of the acquisition field, readers are cautioned to verify the currency of the directives, instructions and other references cited throughout this guide prior to use in actual practice.

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CHAPTER 1.
INTRODUCTION

1.0 PURPOSE

The purpose of this guide is to provide a reference document that facilitates a better understanding of the nature of joint acquisition programs and how joint programs differ from single service programs. Aspects of program management that demand greater emphasis than single-service acquisition programs are discussed to provide an appreciation of the increased complexities resulting from the intricacies of multiservice involvement.

Specific areas of joint service program management are discussed in chapters 2 through 11, beginning with the establishment of a joint program (Chapter 2) to the importance of security (Chapter 11). Chapter 12 presents a discussion of current changes in the field of DoD acquisition that may have substantive impacts on joint program management in the future. The last chapter discusses lessons learned and highlights a selection of successful programs based on interviews with former and current Program Managers (PMs) of Joint Service Programs. The guide also contains six appendices, three of which provide actual examples of currently effective Memorandums of Agreement (MOAs) and a program charter. (Appendices A through C.) Appendix D provides guidance for the preparation of a Joint Integrated Logistics Support Plan (JILSP). Terms and definitions which are primarily applicable to Joint Programs are provided in Appendix E. The final appendix (Appendix F) lists joint acquisition programs that are currently operational.

2.0 USAGE OF TERMS

For consistency and to preclude a certain amount of redundancy, the term "lead service" is primarily used throughout the guide instead of "executive service." In addition, rather than identifying the services involved in a joint program as the "lead and participating services," in all cases, the term "participating services" is used generically in certain instances. Also, the term "material" is used rather than "materiel." Exceptions to the above will occur when referenced material is quoted or reproduced as in the case of Appendix A.

3.0 VARIATIONS OF JOINT PROGRAMS

A variety of Joint Service Programs have evolved over the years to accommodate the specific needs or approaches directed or recommended by the OSD, JCS, JLC or participating services. For reference purposes, the different approaches have been categorized as presented in Table 1-1. The categories range from a program that is basically a single-service program with other services indicating interest in utilizing the end product (see S-2 in Table 1-1), to the multiservice involvement of a fully integrated Joint Program Office (see S-6 in Table 1-1). In addition, the categories also include other varieties of management structures such as those coded M-1 through M-4.

The selection of management and organizational approaches for a proposed joint program should be based on considerations of how best to achieve the program's goals. Approaches are not restricted to those cited in Table 1-1. These categories are based on historical data and may not reflect the current acquisition environment of a proposed new program. Further, various aspects of a program, such as its urgency, importance, size, costs and other factors that may influence its visibility, may affect a joint program and how it does business. A joint cruise missile program, for example, will be different from a joint program for the acquisition of a mobile electric power portable generator. In

TABLE 1-1 JOINT PROGRAM CATEGORIES AND CHARACTERISTICS

Program Category		Characteristics
S-1	See note below	
S-2	Single-service Manager (Executive Agent)	Single-service program; interest from other service(s) manifested by their consumption or use of end product; all program direction and funding has single source
S-3	Single-service PMO with Point of Contact	Single-service program; interest from other service(s) manifested by their designation of a service point of contact (POC) for maintaining liaison
S-4	Single-service PMO with On-Site Liaison	Single-service program; interest from other service(s) manifested by their assignment of a full-time (PCS) liaison officer
S-5	Single-service PMO with Senior Representative	Single-service program; representative(s) from other service(s) assigned to PMO; all authority and responsibility to program manager stems from parent service, no formal coordination of requirements, charter, etc.
S-6	Fully Integrated Joint Program Office (JPO)	Multiservice participation, integrated JPO, staffed by all participating services, directed by program manager assigned by lead service. Participating services may perform some program functions, but on behalf of JPO, not for separate service program. MODEL JPO
M-1	Lead-Service Coordinated Programs	Programs exist in more than one service; one service PMO provides coordinating among all programs; Executive authority does not reside with coordinating PMO
M-2	OSD Directed Programs	More than one service has program in the technical discipline. A lead service is not assigned. The objectives of the programs may not be the same. Direction, coordination and/or standardization is executed not through a designated lead service, but by the OSD, either directly, or through a PMO established for the purpose and reporting, not to a military service acquisition commander, but the OSD
M-3	Confederated Programs	More than one service has at least one program in the generic technical area and the end products of which are used in allied but separate warfare areas. The PMOs characteristically share technical information and development data
M-4	Single-service Requirement—Other Service Tasking	Single-service has specific requirement, but acknowledging that another service has preeminent capability or interest in execution of a part of the program objective, arranges for that segment to be executed by the other service

Note: A Program Designator Code of S-1 denotes a single-service program and accordingly is not included in the table.

addition, in the course of an acquisition program, management or organizational approaches may need to evolve from one category to another over the years due to a number of circumstances, such as increased top-level interest, revised mission priorities, funding allocation changes, etc.

4.0 JOINT SERVICE GUIDANCE

Over the years, through the cooperative efforts of the services, policy and procedural guidance on joint program management has been developed and published as joint service documents. The documents generally treat a specific area of joint program management in detail. The documents are listed in Table 1-2.

5.0 ACQUISITION PROGRAM MANAGEMENT GUIDANCE

A number of single service program management guides or handbooks have been developed that can be beneficial to involved participating service personnel and to lead service personnel as aides in understanding participating services' acquisition procedures. Also, the Defense Systems Management College (DSMC) has published a program manager's notebook. See Table 1-3 for a listing of the guides and notebooks.

TABLE 1-2 JOINT SERVICE PROGRAM MANAGEMENT DOCUMENTS

TITLE	DESIGNATION			
	ARMY	NAVY	AIR FORCE	MARINE CORPS
Configuration Management	AR 70-37	SECNAVINST 4130.2	AFR 65-3	SECNAVINST 4130
Interservice Formal School Training	AR 351-8	NONE	AFR 50-18	NONE
Joint Design to Cost Guide	AMC P 700-6	NONE	AFLCP/AFSCP 800-19	NONE
Management of Multi-Service Systems, Programs, and Projects	AMCR 70-69	NAVMATINST 5000.10A	AFSC/AFLC R 800-2	NONE
Management And Execution of Integrated Logistic Support (ILS) Programs For Multiservice Acquisitions	AR 700-129	OPNAVINST 4105.2	AFR 800-43	MCO 11310.86
Joint Service Automatic Testing Acquisition Planning Guide	AMC P 700-19	NAVMAT P-9404	AFSCP/AFLCP 800-38	NAVMC-2719
Built-In-Test Design Guide	AMC P 34-1	NAVMAT P-9405	AFLCP/AFSCP 800-39	NAVMC-2721
Joint Service Weapon System Acquisition Review Guidelines for Automatic Testing (AT)	AMC P 70-10	NAVMAT P-9406	AFLCP/AFSCP 800-40	NAVMC-2720
Selection Guide for Digital Test Program Generation Systems	AMC P 70-9	NAVMAT P-9493	AFLCP/AFSCP 800-41	NAVMC-2718
Interservice Depot Maintenance	AMC R 750-10	NAVMATINST 4790.21A	AFLCR/AFSCR 800-30	MCO P 4790.10

TABLE 1-3 ACQUISITION PROGRAM MANAGEMENT GUIDANCE

SERVICE/ COMMAND	DOCUMENT TITLE & (REFERENCE NUMBER)	REQUEST/ORDER SOURCE & NUMBER, IF APPLICABLE
Air Force	A Guide for Program Management (AFSC P-800-3) Acquisition Logistics Management (AFLC/AFSC P-800-34)	AFSC/DAPL Air Force Systems Command (AFSC) Andrews AFB, 20334-5000 (Submit Letter Request)
	Acquisition Management Illuminations for System Program Offices (ASD P-800-22)	2750 ABW/DADA Wright-Patterson AFB, Ohio 45433-5001 (Submit Letter Request)
Army	Materiel Acquisition Handbook (AMC/TRADOC P-70-2)	DTIC (Assess Number to be Assigned)
Navy	Best Practices-How to Avoid Surprises in the World's Most Complicated Technical Process, March 1986 (NAVSO P-6071)	GPO Stock No. 008-050-00234
	Navy Program Manager's Guide, 1985 Edition (NAVMAT P-9494)	DTIC ADA 151-925
Marine Corps	Project Officers Guidebook	USMC HQ (Submit Letter Request)
DSMC	Acquisition Strategy Guide	GPO Stock No. 008-020-01028-6
	DOD Manufacturing Management Handbook	GPO Stock No. 008-020-01095-2
	Establishing Competitive Production Sources	GPO Stock No. 008-020-01037-5
	Integrated Logistics Support Guide	GPO Stock No. 008-020-01081-2
	Introduction to DOD Program Management (Advance Copy - April 1986)	DSMC (Deputy Director, Program Management Course)
	Risk Assessment Techniques	GPO Stock No. 008-020-00953-9
	Skill in Communication	GPO Stock No. 008-020-01036-7
	Strategies for Dealing With the Defense Budget	DTIC ADA 134-459
	System Engineering Management Guide 2nd Edition, December 1986	GPO Stock No. 008-020-01099-5
	The Program Manager's Notebook, October 1985	DTIC ADA 176-002
	The Warranty Guide	DTIC ADA 170-448

CHAPTER 2

JOINT PROGRAM INITIATION

1.0 SYNOPSIS

This chapter discusses the important aspects of establishing joint programs for the acquisition of defense systems and the initiation activities involved. Rationale for the establishment of joint programs are presented in section 2.0. In section 3.0, background information is provided regarding the establishment of joint programs in recent years, including the efforts of the Joint Requirements Oversight Council (JROC). Section 4.0 presents a summary of each of the Services' processes and procedures for the harmonization of requirements. The process of initiating joint programs, including Memorandums of Agreement (MOA), are discussed in section 5.0. A discussion about the preparation of Joint Program Charters is presented in section 6.0. A summary of the chapter is provided in section 7.0.

2.0 JOINT PROGRAM INITIATION RATIONALE

Joint programs for the acquisition of defense systems should be carried out efficiently and effectively in accordance with DoDD 5000.1 of 12 March 1986 and DoDI 5000.2 of 12 March 1986.[1/2/] Rationale for the establishment and initiation of a joint program rather than a single service program can be numerous and vary in complexity. Most joint programs are primarily instituted for either operational or economic advantages, or both. Typically, one or more of the following factors will contribute to the decision to initiate a joint program:

- *Improvement of Combat Capability Need.* Multiservice weapon system enhancement may be needed to meet a newly identified threat or to respond to a modified threat that requires new measures to counter it.

- *Interoperability of Equipments.* Interfaces, especially in the areas of command and control, communications, and intelligence, where interdependence of air, ground, and naval forces necessitate joint definition and central control of system emphasize the need for joint acquisition.

- *Coordination of Efforts.* Coordination reduces duplication of effort, improves exchange of technical information, and channels individual service efforts into mutually supporting programs.

- *Reduction in Development Costs.* All other things being equal, one development program should be less expensive than two. If the requirements of the services are compatible, and consolidations of programs does not increase risk unduly by closing out alternatives, one joint program should be more cost effective than multiple, single-service efforts.

- *Reduction in Production Costs.* Consolidation of the services' production requirements should lower unit price through savings in set up costs, learning curve impacts, special tooling, and quantity production or procurement of unit components.

- *Reduction in Logistics Requirements.* Standardization across services offers potential for both reducing support costs and improving the support provided to operating forces.

- *Multiservice Application.* When certain operational needs or requirements are similar, such as in the case of the Army and the Marine Corps, acquisition should be by joint means.

3.0 ESTABLISHING JOINT PROGRAMS

Joint programs can and should be established through agreements between two or more services whenever a mutual or similar need or requirement exists as in the case with the Air Force and the Navy establishing the Cobra Judy Radar Program. In the past, however, congressional interest in a program often prompted the Office of the Secretary of Defense (OSD) to take the lead in establishing a program as a joint effort, such as in the case of the Copperhead Program, or through the direction of OSD, as in the case of Base and Installation Security System (BISS) Program. Likewise, influences of the Joint Chiefs of Staff (JCS) or the Joint Logistics Commanders (JLC) resulted in the creation of joint programs such as the WWMCCS Information System (WIS) Program and the Modular Automated Test Equipment (MATE) Program, respectively.[3]

In March 1984, the Joint Requirements Oversight Council (JROC) was created by charter under the auspices of the Joint Chiefs of Staff (JCS) to promote and facilitate the establishment and use of joint programs. The primary responsibilities of the JROC are to: examine potential joint military requirements; identify, evaluate and select candidates for joint development and acquisition programs; provide oversight of cross-service requirements and management issues; and resolve service issues that arise after a joint program has been initiated. Permanent members of the JROC consist of the Vice Chiefs of Staff of the Air Force and Army, the Vice Chief of Naval Operations, the Assistant Commandant ofthe Marine Corps, and the Director of the Joint Staff. As deemed appropriate by the Chairman, JROC, associate members may be designated for each meeting. The JROC chairmanship is rotated among the services.

Since its inception, the JROC has initiated the establishment, or been involved with a number of joint programs, such as Cruise Missile Systems, Reconnaissance Remotely Piloted Vehicles (RPVs) and their payloads and data links, Electronic Warfare Commonality/Joint Programs, Tactical Military Deception (TAC-D) Systems, the MKXV Combat Identification System (CIS), the Space-Based Radar/Infrared (SBR/IR), High Frequency Anti-Jam (HFAJ) Communication Systems, and the WWMCCS Information System (WIS).

In addition to the above activities, the JROC has also been involved in identifying joint requirements and promoting a joint service position on joint program funding. A Memorandum for Record was issued in August 1986 that presented a joint service position, endorsed by the JROC, regarding the preferred funding arrangement for joint programs. The concept for joint program funding was presented as follows:[4]

- The lead Service, particularly on major programs, should have total program funding authority and responsibility. Funding arrangements should be agreed to as early in the acquisition process as possible.

- Each participating Service should fund its own:

  - Service unique integration efforts
  - Service unique improvements/ changes
  - Service procurement

- Programs falling under this concept must have:

  - a firm statement of requirements
  - a commitment to funding (R&D and procurement)
  - a detailed MOA/MOU covering funding, management, and technical baselines.

Subsequently, in September 1986, the JROC issued another Memorandum for Record regarding the policy and procedures for joint potential review and designation of programs and requirements.[5] The memorandum stated that the benefits of combined efforts among the Services in development and acquisition of material are well recognized. The potential cost savings associated with quantity buys and the military advantages of interoperable/common equipment on the battlefield are compelling reasons to address "jointness" with even greater emphasis. Although there will be programs/requirements in which unique Service needs will preclude joint development or procurement, it is the intent of the JROC that each Service implement procedures whereby programs/requirements are reviewed to determine the potential for inter-Service cooperative ventures. The elements of the policy are:

- The Services are responsible for ensuring that this review is performed.

- When other Services are requested to comment on a program/requirement, they shall respond within a reasonable time period.

- The Services are responsible for preparing a comprehensive list of the programs/requirements reviewed.

- The Service directors of R&D shall meet yearly to review their lists.

- These lists shall be forwarded to the JROC with a certification that the required review has been accomplished and with a "joint potential" designator assigned to each program/requirement.

- These procedures shall apply to all acquisition categories (I through IV).

- Technology Base programs shall be exempt from this process.

The intent of the policy is to stimulate communications among the Services, and applies to all new Service and Unified and Specified Command requirements documents, as well as all R&D programs approved for initiation and inclusion in the Services Program Objective Memorandums (POMs), and all programs facing a milestone I or II review during Fiscal Year 1987.

The joint potential review and designation process encompasses the following actions:

- Each Service will, when appropriate, solicit the other Services' comments on the joint potential of each new R&D program approved for initiation and each new Service requirement document. When comments are solicited, response will be mandatory. Unified and Specified Command requirements will be reviewed by the Joint Staff with Service participation.

- Each Service will be individually responsible for assigning a joint potential designator to each requirement/program. The Joint Staff will assign designators for Unified and Specified Command requirements. Designation will be in accordance with the following criteria.

  - Independent. Independent programs and requirements are those in which there is no potential for other Service use or joint systems development.

  - Interoperating. Interoperating programs and requirements are those in which joint program management is inappropriate, but a potential for joint operation or joint systems interface exists.

  - Joint. Joint programs and requirements are those in which a potential for joint R&D program management and/or joint procurement exists.

- Annually, each Service will be responsible for preparing a Joint Potential Designation List (JPDL) of all new programs and previously designated programs facing a milestone I or II review during the next fiscal year. The Joint Staff will prepare a JPDL for Unified and Specified Command requirements.

- These lists will be individually and jointly reviewed by the directors of R&D in each Service by 1 March each year for completeness and the appropriateness of the designator assigned to each program. The Secretary, JROC, will review the Unified and Specified Command requirements JPDL and will coordinate the scheduling of the R&D directors' review.

- No later than April each year, these lists will be forwarded by each Service director of R&D to the JROC Secretariat for JROC review either as in-book items or as items for specific attention based upon the recommendations of the Service directors of R&D and/or the Secretary, JROC.

- Programs receiving initiation approval after the JPDLs have been forwarded to the JROC will be designated, jointly reviewed, and referred to the JROC within 90 days of Service approval.

- Completed joint potential review and/or designation will not be mandatory before the Services can fund any given program, but is it the intent of the JROC that Service, Military Department, and DoD formal acquisition reviews include joint potential review designation as an item of interest.

4.0 HARMONIZATION OF REQUIREMENTS

The Services involved in a joint acquisition should follow the established requirements process and procedures for the harmonization of requirements in order to adjust or resolve differences or inconsistencies and thus bring significant features into agreement. A summary of each Service's requirements process and procedures for the harmonization of requirements are presented below:

- **Air Force**

Details of the Air Force operational requirements process are delineated in the Air Force Regulation (AFR) 57-1 of September 1987. The process calls for brief, generalized Statements of Operational Need (SON), the delegation of validation authority to the Major Commands (MAJCOMs), a corporate review of System Operational Requirements Documents (SORDs) prior to major milestones, and the development of a Requirements Correlation Matrix (RCM). Also Depot Support Requirements Documents (DSRDs) will be directed by Program Management Directives (PMDs) action.

The Directorate of Plans, HQ USAF/XOX, is the Office of Primary Responsibility for AFR 57-1.

When a SON is prepared by the user that identifies and states operational needs in mission areas shared by other Air Force MAJCOMs or Separate Operating Agencies (SOAs), operating commands must coordinate with those organizations. Multi-command SONs are to be processed by the lead command in the same manner as those developed by a single command. Operational commands will develop SONs in close coordination with the implementing command to ensure that all major issues are resolved prior to validation. Subsequently, the SONs will be forwarded to HQ USAF/XOXFQ for coordination, including formal coordination with other Services.

The operating command will submit a System Operational Requirements Document (SORD) for each funded program as tasked in the Program Management Directive (PMD). The SORD is the requirements and planning document prepared to address operational and support needs. It amplifies and refines SON. Operational commands will develop SORDs in close coordination with implementing commands to ensure that all major issues are resolved prior to SORD approval.

For programs with RDT&E costs greater than $50 million and/or total program costs greater than $250 million (FY80 dollars), the SORD will be reviewed and approved by HQ USAF/XOX. Operating commands retain approval authority below these thresholds.

The Requirements Correlation Matrix (RCM) has a primary purpose to document and track the formulation of and changes to user requirements as they evolve through the program acquisition process. The RCM is a mandatory attachment to all SONs and SORDs as directed by the PMD.

The Depot Support Requirements Document (DSRD) is a stand-alone document that is an adjunct to and complements the SORD. The DSRD describes the supporting command's plans and requirements for providing both maintenance and material support to the system described in the SORD.

Following MAJCOM-level review and coordination, DSRDs will be submitted to HQ USAF/LEYM for approval.

In addition, HQ USAF/XOX harmonizes Air Force needs with other Services for purposes of applicability, commonality, standardization and interoperability, and also ensures that other service requirement documents receive appropriate Air Force functional review.

- **Army**

The Army's requirements process is outlined in AR 71-9, Material Objectives and Requirements, with implementing instructions in AMC-TRADOC pamphlet 70-2, Materiel Acquisition Handbook. Responsibility for requirements on the Army Staff falls in the Force Development Directorate of the Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS). Although the ODCSOPS is the DA staff element responsible for requirements, and in fact validates most requirements in the Army process, the Army's Training and Doctrine Command (TRADOC) plays a very key role.

As the Army combat developer and user representative, TRADOC, is responsible for the generation and staffing of Army requirements. While requirements usually originate in one of the TRADOC schools, formal world-wide staffing is the purview of the TRADOC headquarters. In fact, the "harmonization process," or the process whereby the requirements are staffed by the other Services, occurs at the same time as the staffing by major Army commands and is the responsibility of TRADOC, not the Army staff.

One major difference exists between the Army and Air Force processes in that the Army requirements can be documented in several formats as compared to a single one of the Air Force.

- **Navy**

The Navy's requirements process is described in OPNAVINST 5000.42C of 10 May 1986. The Navy's process is managed by the Director, Research, Development and Acquisition (OP-098) in the Office of the Chief of Naval Operations. The Navy's process, having undergone significant change in 1983, differs from the process of the other Services.

Program initiation begins with the promulgation of a Tentative Operational Requirement (TOR). The TOR is then circulated to other Services for harmonization of requirements. In response to the TOR, a Development Options Paper (DOP) is initiated by the appropriate Systems Command (SYSCOM). The DOP will address a range of alternatives, to include other Services' requirements, and cost trade-offs. An Operational Requirement (OR) is developed by the program sponsor after examining the options presented in the DOP.

In the Navy process a promulgated OR is required before a program will be considered for POM funding but does not automatically ensure POM funding when submitted. If an OR is not funded it will be reviewed during the following year's POM cycle. Most ORs are sent out for harmonization, when approved, whether funded or not.

- **Marine Corps**

The Marine Corps requirements process is described in MCO 3900.4C, MCO 5000.15, and MCO P5000.10A. The Marine Corps, limited in both RDT&E funding and management resources, must depend on or work jointly with the other Services to satisfy many of its requirements.

The Marine Corps requirement documents are prepared by the Marine Corps Development and Education Command (MCDEC). The requirement is initially represented in a Justification for a Major System New Start (JMSNS) or, for a less than major system, a Justification for System New Start (JSNS). Once the JMSNS/JSNS is approved and validated by Headquarters Marine Corps (HQMC), a Required Operational Capability (ROC) is published which describes the requirement in more detail. These documents (JMSNS/JSNS/ROC) are prepared in draft form and distributed to the other Services so that their comments can be reviewed prior to document approval.

An example of how the harmonization issue is addressed at the OSD level may be seen in the functioning of the Armament/Munitions Requirements, Acquisition and Development (AMRAD) Committee. The mission of the AMRAD Committee is to assist OSD level offices, JCS, Military Departments and other DoD components in developing harmonized requirements which fulfill multiservice munitions and related subsystem needs. The committee is composed of senior members from each service and they act in an advisory capacity to promote effective and efficient munitions acquisition.

5.0 JOINT PROGRAM INITIATION

Although each joint program is unique in that it addresses a particular set of requirements subject to various operational, fiscal and political constraints, all joint programs are initiated through similar processes, such as those discussed in section 3.0 above as well as the following:

- Determining that a common or related set of requirements exists among two or more services and/or that the requirements could be most cost effectively achieved through a joint program. This normally occurs during the review of a "Justification for Major System New Start (JMSNS)" in the major system acquisition process, or a comparable but less formalized vehicle in less than major systems acquisitions, *e.g.*, during a budget review or in reviews of Joint Operational Requirements (JORs). For major systems acquisitions, this decision is normally documented in a Secretary of Defense Decision Memorandum, (SDDM), which specifies the lead DoD component and provides explicit guid-

ance regarding the responsibilities of the participating services.

• Within the context of the OSD guidance, participants in a joint program negotiate specific roles, activities, responsibilities, and fiscal support to be provided by the lead and participating services.

• When successfully concluded, these negotiations will result in one or more Memorandum of Agreement (MOA) between the participating and lead services. A well developed MOA is highly essential to the success of any joint program, particularly the agreements on requirements and funding (see Appendix A).[6/] When agreement is reached at either the service headquarters or secretariat level, it is usually documented by an MOA. There is no typical content or format for an MOA. It may be a long document, defining all the ground rules for the joint program or it may be very brief, covering only key areas of agreement, such as designation of the lead service and sharing of funding responsibility. Frequently, a program will have several MOAs, each covering a different topic. Additional negotiations and program definition activities can subsequently lead to the Joint Program Manager's Charter. The charter, when promulgated, becomes the foundation for the joint program. It formally establishes the program and announces to all concerned the responsibilities and intended relationships among the participating services. Appendix B contains a Joint Program Manager's Charter for the V-22 OSPREY Program.

• The implementation of OSD direction is different in each of the services. The Army and Navy simply forward by memorandum USD(A) direction to the appropriate development and acquisition activity via the chain of command. In the Air Force, HQ USAF directs major command participation, either as lead or supporting elements, via Program Management Directives (PMD). Further delineation of participation below major command level is promulgated by Form 56 within AFSC, and Program Action Directive (PAD) within AFLC.

• Interservice negotiations and agreements on joint programs can be accomplished at any of several echelon in the services' organizational hierarchies: the service secretariats, the service headquarters, the material development and logistics commands, or their commodity-oriented commands. However, exceptions do occur, for example, the Commanders of the Naval Air Systems Command and the Air Force Systems Command have agreements on acquisition of air-to-air missiles.

If there is a general rule, it is to agree that the lowest level agreement is practicable, with the understanding that the level will vary from program to program. However, there are two advantages to agreements at the service headquarters level: (1) it is the level at which operational requirements are validated and translated into equipment needs; and (2) it is the level at which funding priorities are established.[7/]

6.0 JOINT PROGRAM CHARTERS

Preparation of the Program Manager's Charter. An interim charter, setting forth a basic set of ground rules under which the Program Manager and participating services will operate prior to promulgation of the formal Program Manager's Charter, may be issued by OSD or by the cognizant Command within the lead service. The preparation of the final charter is normally the responsibility of the lead service, subject to negotiations with the participating services. The designated lead service Program Manager is usually responsible for developing the charter, with the assistance and concurrence of the partici-

pating services. In a few instances, OSD has promulgated the charter for joint programs in which they were particularly interested. Even if an MOA has been signed and there is no formal requirement to gain concurrence from the other services, it is in the best interest of the Program Manager (PM) and the program, to staff the charter with the participating services.

If OSD retains approval authority, the lead service is responsible for the submission of the charter. There are two ways the charter can be submitted:

First, if OSD specifies that the charter be submitted through the JCS, the charter should be submitted by the service chief to the JCS and a joint action initiated to gain a JCS recommendation for OSD. Once the joint action is started, the responsibility for the action lies with the joint action officer and the lead service reverts to being a voting member with the same status as the other services. Also, the services that may not be a party to the program are involved and will vote on the charter in the joint action. Second, if there is no requirement for a JCS recommendation, the charter will more than likely be submitted to OSD by the service secretary.

Promulgation of the Charter. For less-than-major system acquisitions, the charter is normally promulgated by the material or logistic Command within the lead service. Major acquisition charters are promulgated at higher echelons within the lead service, such as the Secretary of the Army, the Navy Acquisition Executive, and the cognizant Air Force Chief of Staff. Although the JLC "Memorandum of Agreement - Management of Multiservice Systems/Programs/Projects" (Appendix A) calls for joint approval of Joint Program/Project Manager's Charters, such jointly-signed charters are rare.

Establishing the Program Manager's Authority. While a charter cannot guarantee that the joint program manager will have authority commensurate with his responsibilities, care should be taken to ensure that the charter gives him the authority needed to manage, rather than merely to coordinate the joint program. Specifically, the Program Manager must have adequate authority to:

- make trade-offs between cost, schedule, supportability and performance within bounds established for the program,
- identify program funding needs and to control funds allocated to the program,
- determine and control hardware and software configuration,
- communicate directly with other services and Government agencies, and
- manage his military and civilian staff.

Attributes of an Effective Joint Program Charter.[8/] Joint programs are exceptions to the services' normal acquisition practices. Thus, the Joint Program Charter must include those elements essential to any charter and those needed to define specific relationships among the participating services. The extent to which the latter must be defined in the charter depends on the circumstances surrounding establishment of the joint program. If, at the inauguration of a joint program, there exists a major issue involving responsibility, authority, or interservice relationships, it should be resolved in the charter to preclude future problems. The following items are considered essential in a Joint Program Charter.

- Designation of the Joint Program.

- Statement of the Program Objective. It is extremely important that this section of the charter be well written and not open to interpretation. It is where the bounds are established.

- Definition of the PM's Authority, Responsibility, and Accountability. The accountability must be delineated specifically, since some participating services may want a certain amount of accountability by the PM to them. What must be avoided is having a joint PM answering to too many people and organizations.

- Specifications of Program Funding and Resources. The Joint Requirements Oversight Council (JROC) issued a joint Service position on the preferred funding arrangement for joint programs.[1/] The concept is presented in section 3.0 of this chapter.

- Definition of the Services' Joint or Unilateral Responsibilities for Program Execution, including service unique requirements.

- Description of the Relationship of the Joint Program with Other Programs, Supporting Organizations, and Supported Organizations.

- Identification of the Chain of Command for the Reporting and Resolution Program Issues. Every attempt should be made to keep the issue resolution level as low as possible.

- Reporting Requirements (Type, Format, and Frequency). The PM should keep the participating services and the user, especially the joint users, informed of the program status. Provisions for this type of reporting should be included in the charter.

- Program Office Organization and Initial Staffing, including in the case of the Navy, the PM's responsibilities on major acquisition programs to the designated Program Executive Officers (PEOs)/Acquisition Executive.[2/]

- Requirement to Establish Joint Operating Procedures.

The following items are "officially" optional elements but in reality should be considered as essential:

- Assignment of the Deputy PMs from the Participating Services, Definition of Their Responsibility and Authority and Designation of their Rating Officials.

- Methods of Resolving Conflicting Requirements or Objectives of the services Involved.

- Creation of Joint Committees for Coordination or Approval of Key Aspects of the Program (*i.e.*, Requirements, Funding, Source Selection, Test and Evaluation Plans, and Configuration).

- Performance Evaluation of Personnel.

Review and Update. As a joint program progresses through the acquisition process, management needs and relationships of the participating services probably will change. Therefore, the Joint Program Manager should review the charter periodically, at least annually, to ensure that its descriptions of program mission, responsibilities and authority of the program manager, and interservice relationships are still accurate. The charter should be revised as appropriate.

7.0 SUMMARY

- Joint programs should be established and accomplished in accordance with DoDD 5000.1 of 12 March 1986 and

DoDI 5000.2 of 12 March 1986. (Note: Currently being revised.)

- Rationale for establishing joint programs is primarily based on either operational or economic considerations, or both.

- The Joint Requirements Oversight Council (JROC) was created to promote and facilitate the establishment and use of joint programs. In addition, the JROC has published joint service positions on the preferred funding arrangement for joint programs, and the policy and procedures for joint potential review and designation of programs and requirements.

- The Services involved in a joint acquisition should follow the established requirements process and procedures for the harmonization of requirements as specified in the Service's directives.

- Initiation of joint programs normally occur during the review of the JMSNS, budget reviews, or JOR reviews.

- MOAs between the participating services should delineate the specific areas of agreement, subsequent to any necessary negotiations regarding respective service responsibilities.

- Joint Program Charters should be as specific as possible regarding the items cited in section 6.0 above.

- Joint Program Charters should be reviewed periodically, and at least annually.

REFERENCES AND FOOTNOTES:

1/ DoD Directive 5000.1, "Major System Acquisitions," 12 March 1986. (Currently under revision.)

2/ DoD Instruction 5000.2, "Major System Acquisition Procedures," 12 March 1986. (Currently under revision.)

3/ "Joint Program Study, Final Report, Volume II," prepared by the Joint Service Acquisition Program Management Study Ad Hoc Group, 27 July 1984, p. B-12, ADA 154-911.

4/ JROC Memorandum for Record, "Joint Program Funding," 7 August 1986.

5/ JROC Memorandum for Record, "Policy and Procedures for Joint Potential Review and Designation of Programs and Requirements," 4 September 1986.

6/ Joint Regulation AFLC/AFSC R 800-2, AMC R 70-59, NAVMATINST 5000.10A, "Management of Multi-Service Systems, Programs, and Projects," 4 Sept. 1973.

7/ "Program Manager's Notebook," Defense Systems Management College, Oct. 1985, pp. 1.10b-1.10c.

8/ "Program Manager's Notebook," p. 1.10d.

9/ SECNAVINST 4210.8, "Acquisition Organization and Procedures."

CHAPTER 3

JOINT REQUIREMENTS

1.0 SYNOPSIS

Significant aspects and considerations regarding the development of joint requirements are discussed in this chapter. Joint requirements rationale is presented in section 2.0. Section 3.0 provides guidance for the establishment of joint requirements. An approach proposed by a recent Defense Science Board study, to improved requirements management, is discussed in section 4.0. The preparation and use of requirements documents, particularly the Justification for Major Systems New Starts (JMSNS) is presented in section 5.0. Finally, a summary of the chapter is provided in section 6.0.

2.0 JOINT REQUIREMENTS RATIONALE

The most critical aspect in commencing a joint service acquisition program is the delineation of the needs of each participating service and the resolution and harmonization of those needs into a specific requirements statement. The General Accounting Office (GAO) has stated that getting agreement on joint requirements documents is the number one problem in joint acquisition programs.[1/] Accordingly, the statement of operational requirements becomes virtually essential to the future success of any joint program. The premise of a joint program is that there is sufficient commonality in the services' requirements that a joint effort will be beneficial. In addition, the developed joint requirements must satisfy the operational needs of all participating services without unduly compromising individual service needs, imposing restrictive technical approaches on the program, or developing a system that becomes cost prohibitive.

Likewise, the requirements for tactical Command, Control, Communications and Intelligence (C^3I) systems should include considerations for the compatability and interoperability of the system with other U.S. tactical C^3I systems and equipment in accordance with DoD Directive 4630.5 of 9 October 1985.[2/]

3.0 ESTABLISHING JOINT REQUIREMENTS

Normally, the sequence of events in a multiservice acquisition is for the Joint Justification for Major Systems New Starts (JMSNS) to be prepared in accordance wth DoD Directive 5000.1 of 12 March 1986[3/] and DoD Instruction 5000.2 of 12 March 1986[4/] or other requirements documents, in the case of non-major systems, and to be approved prior to initiation of the program and appointment of the program manager. In practice, events may not occur in that order since many requirements documents are being written to support existing programs. Furthermore, because many joint programs are created by merging two or more single-service programs, or by existing Joint Program Offices, the joint program manager (PM), may need to prepare, coordinate, or revise the joint JMSNS or Joint Operational Requirements (JOR) documents. In any case, the PM should ensure that the statement of requirements meets the needs of the joint program.

Several important characteristics of joint requirements documents, particularly, preliminary documents, should be considered. They are negotiated statements. The tendency is for each service to overstate or overspecify requirements to ensure that its needs are met. The working of the requirements may be a compromise to which each service may agree, but interpret differently. Some

key aspects of the requirements may be omitted, either through oversight or because agreement was not possible.

At the outset of a joint program, the joint program manager should conduct a detailed technical requirements review that examines mission needs, operational concepts and environments, and performance parameters. The PM should ensure that requirements are understood, that conflicts are resolved, and that there is sufficient latitude to make the trade-offs essential to any program's success.

Once the requirements of each service are well understood, the joint program manager should define the set of essential requirements which is most demanding in terms of cost, schedule, support, and performance criteria. This will require determining which requirements are subsumed by others. It will also require determining the extent to which commonality of hardware and software, frequently an explicit or implied goal of a joint program, is a valid requirement and is achievable. Some joint programs will be considered successful only if they develop identical or nearly identical systems for use in all services. The value of other joint programs, however, may be only in sharing the costs of concept formulation and validation or in coordinating the engineering development of systems peculiar to each service and ensuring their interoperability: trying to develop identical or nearly identical systems for all the services may frustrate the program and lead to its failure.

The preparation for each milestone review (see Chapter 5, Program Review) should include a re-examination of the same items reviewed at the initiation of the joint program. This re-examination should determine not only that the participating services' perception of the requirements have not changed, but also that the threat or other basis for establishing the system's need remains consistent with the initiating need. A revised threat assessment will bring about a redirection of other elements of the JMSNS. Although program requirements stability is a prime objective, the PM should take the opportunity afforded by the review process to ensure that the PM's program meets the current and projected threat and that joint test and evaluation demonstrate the fulfillment of current and projected mission requirements.

4.0 JOINT REQUIREMENTS AND MANAGEMENT

The study conducted by the Defense Science Board (DSB) on Joint Service Acquisition Programs is recommended reading for all joint acquisition program managers.[5/] One of the most significant results of the study was the conclusion that the issue of requirements is really so interwoven with the technical and managerial issues, that a new process was identified and named, "Joint Requirements and Management" (JRM).

The DSB identified several major programs that suffered as a result of failures in the JRM process. Two of these were the JSTARS and the F-111. Conversely, the Defense Satellite Communications System (DSCS) was identified as a program given reasonable chance of success partly because of the JRM being conducted at the start of the program.

The objective of the JRM process is to structure a program that will:

- Increase military effectiveness,
- Achieve efficiencies and economies,
- Exploit technology, and

- Be credible to the Congress and public.

The process appears to be highly iterative and composed of a wide range of interaction. The DSB Study Group concluded that there were several major issues that should be resolved before a joint program is begun. These issues are:

- Operational concepts,
- Performance specifications (including interoperability and supportability),
- Technical approaches and options,
- Acquisition strategy,
- Cost and schedule,
- Relative worth vis-a-vis current and alternative systems, and
- Management structure.

The manager, or prospective manager of a joint program must be prepared to deal with differing organizational viewpoints between and even within the five groups listed below:

- OSD,
- JCS,
- Unified Commanders,
- Services, and
- Other government agencies and Industry.

5.0 REQUIREMENTS DOCUMENTS PREPARATION AND USE

The basic requirement document for a major acquisition program is the Justification for Major System New Starts (JMSNS). Procedures for preparing the JMSNS are provided in DoD Directive 5000.2[4/] A JMSNS identifies a specific deficiency in a mission area, the priority assigned to correcting the deficiency, and the magnitude of resources needed to correct the deficiency. A brief outline of a JMSNS is shown in Table 3-1, and a comprehensive listing is provided in the DSMC, "Program Manager's Notebook."[6/] A joint JMSNS documents major deficiencies in two or more services. Approval of a JMSNS is a prerequisite for initiation of a major system acquisition program.

Office of the Secretary of Defense (OSD) and Office of the Joint Chiefs of Staff (OJCS) may additionally prepare JMSNS in response to mission area deficiencies. When an OSD or OJCS JMSNS is submitted, a lead DoD component should be recommended to the Secretary of Defense.

A JMSNS is required for each major acquisition, including system modifications and additional procurement of existing systems, which the DoD component anticipates will cost in excess of $200 million (FY 1980 dollars) in research, development, test, and evaluation (RDT&E) funds or $1 billion (FY 1980 dollars) in procurement funds. A JMSNS is not required for programs, regardless of size, directed toward developing and maintaining a viable technology base.

The deficiency or opportunity identified in a JMSNS should be defined as narrowly as possible to allow a reasonable probability of correcting the deficiency by acquiring a single system. Defining a broad architecture of systems to counter projected threats in a mission area is part of the ongoing analysis of mission areas rather than a part of a specific acquisition program. Though the scope of the deficency identified in a JMSNS shall be narrowly defined, solutions to the problem shall not be

TABLE 3-1 JUSTIFICATION FOR MAJOR SYSTEMS NEW STARTS [4]

A. DEFENSE GUIDANCE ELEMENTS
1. Defense Guidance Element identification

B. MISSION AND THREAT
1. Mission area and system application
2. DIA-validated threat and current shortfall
3. Timing of the need
4. Priority of the system relative to others in the Mission Area

C. ALTERNATIVE CONCEPTS
1. Known alternatives to be considered during Concept Exploration
2. If an alternative has been selected, describe why others were rejected
3. Remaining tradeoffs to be conducted for selected system

D. TECHNOLOGY INVOLVED
1. Maturity of technology for the selected system design and production
2. Remaining risk areas

E. FUNDING IMPLICATIONS
1. Affordability
2. Component funding
3. Gross cost estimates for the selected concept
   a. Total RDT&E
   b. Total Procurement
   c. Life-Cycle Cost

F. CONSTRAINTS
1. Survivability
2. Logistics
3. Manpower
4. Computer resources
5. Standardization or interoperability within NATO or other DoD components
6. Critical materials and industrial base applications

G. ACQUISITION STRATEGY
1. Program structure
2. Competition
3. Contracting

specified. Alternative concepts and associated risks shall be evaluated in the Concept Exploration phase.

Since the JMSNS is used for joint programs and other major acquisitions, operational requirements for less-than-major acquisitions will probably continue to be stated in service-peculiar requirements documents which tend to be more detailed and more weapon-system-oriented (vice mission-oriented) than a JMSNS. This same practice is likely to hold true for joint acquisitions: major acquisitions will be supported by a joint JMSNS; less-than-major acquisitions will be supported by a Joint Operational Requirement (JOR), or similar document, which is more detailed and more weapon-system-oriented than a JMSNS.

In the Army, the Deputy Chief of Staff for Operations and Plans (DCOPS) develops the force requirements and provides guidance for the preparation of the JMSNS, and Required Operational Capabilities (ROC). The Commanding General, Training and Doctrine Command (TRADOC) subsequently prepares the documents.[7/8/]

For major programs, the Mission Need approval is accomplished by submitting the JMSNS along with the Program Objectives Memorandum (POM), and SECDEF approves the new start via the Program Decision Memorandum (PDM). For non-major programs, the Mission Need is approved by the LOA for the Designated Acquisition Programs (DAP) and signed jointly by the materiel developer and combat developer. The DAP is then forwarded to Headquarters, Department of the Army, HQDA (DAMO-RQ) for approval. LOAs for other programs are forwarded for information. The Army Acquisition Executive (AAE) approves the DAP new starts via the System Acquisition Decision Memorandum (SADM). Other programs are approved by the LOA. Army Regulation 71-9 defines levels of approval for the LOA.[9/]

System Acquisition in the Navy is based upon requirements documented in the Operational Requirement (OR) and the Required Operational Capability (ROC) for the Marine Corps in accordance with OPNAV Instruction 5000.42C[10/] If the program involved is considered to be an Acquisition Category I (ACAT I) Major program, the appropriate mission sponsor (Deputy Chiefs of Naval Operations (DCNOs)) prepares the JMSNS.

For all Department of the Navy programs, the OR or ROC is approved by the CNO or CMC. For major programs a JMSNS is then submitted with the next Navy POM submittal. Major programs are approved by the Secretary of Defense via the Program Decision Memorandum (PDM). A Tentative Operational Requirement (TOR) document is developed by OPNAV which describes a need for a new system in general terms. The TOR is distributed to the appropriate SYSCOM. A Development Option Paper (DOP) that is based on the exploration of options, is created by the SYSCOM, which describes a range of possible systems covering a spectrum of capabilities that are considered responsive to the TOR. The DOP is submitted to OPNAV and SECNAV for consideration. Subsequently, an Operational Requirement (OR) document is developed that describes the major characteristics of the alternative selected by the OPNAV sponsor, as a result of the DOP review, which best matches the desired capabilities within affordability limitations.

In the Air Force, requirements originate in the operating commands, such as the Tactical Air Command (TAC), where they are documented as Statements of Need (SON) in accordance with Air Force Regulation (AFR) 57-1.[11/] AFR 57-1 is supported by the Air Force 800

series regulations for acquisition and implementation procedures provided by AFSC pamphlet 800-3. A SON that may lead to major system acquisition program is transformed into a JMSNS by the Deputy Chief of Staff (Operations, Plans, and Readiness) (AF/XOX) and the Deputy Chief of Staff (Research, Development and Acquisition) (AF/RDQ)

When a Joint or OSD/OJCS JMSNS is submitted, the SECDEF decision is then documented in a Secretary of Defense Decision Memorandum (SDDM).

6.0 SUMMARY

- Obtaining agreement on joint requirements documents has been identified by GAO as a major problem in joint acquisition programs.

- Joint requirements must satisfy the operational needs of all participating services without unduly compromising individual service needs, imposing restrictive technical approaches on the program or developing a system that becomes cost prohibitive.

- Consideration must be given to tactical C^3I systems compatability and interoperability with other applicable systems.

- Development of the requirements documents require the special attention of the joint program manager in harmonizing the needs of the participating services.

- To improve a joint program's chances for success, consider the approach of Joint Requirements and Management (JRM) proposed by the Defense Science Board (DSB).

- The basic requirements document for a major acquisition joint or single service program is the Justification for Major Systems New Starts (JMSNS).

- Less-than-major joint acquisition program requirements are documented by a Joint Operational Requirement (JOR), or similar document.

- Each of the services have different procedures for the development of requirements documents.

REFERENCES AND FOOTNOTES:

1/ "Joint Military System Acquisition By The Military Services: An Elusive Strategy," GAO Report NSIAD-84-22 of 23 December 1983, p.12.

2/ DoD Directive 4630.5, "Compatability and Interoperability of Tactical Command, Control, Communications and Intelligence Systems," 9 October 1985.

3/ DoD Directive 5000.1, "Major System Acquisitions," 12 March 1986.

4/ DoD Instruction 5000.2, "Major System Acquisition Procedures," 12 March 1986.

5/ "Joint Service Acquisition Programs," Defense Science Board, OUSDRE, 1983 Summer Study, February 1984. ADA 141-417.

6/ "Program Manager's Notebook," DSMC, October 1985, Fact Sheet No. 3.1.

7/ Lawrence R. Huey, Major, USAF, "Joint Requirements Management," Research Report, PMC Class 86-1, DSMC, 23 May 1986, p. 7.

8/ Army AMC/TRADOC Pamphlet 70-2, "Materiel Acquisition Handbook," 26 March 1987.

9/ Army Regulation (AR) 71-9, "Materiel Objectives and Requirements," 20 February 1987.

10/ Navy OPNAV Instruction 5000.42C, "RDT&E/Acquisition Procedures."

11/ Air Force Regulation (AFR) 57-1, "Operational Requirements and Program Development Process," 28 May 1985.

CHAPTER 4

ACQUISITION STRATEGY

1.0 SYNOPSIS

This chapter dealing with acquisition strategy provides the reader with the general aspects of acquisition strategy as it relates to the acquisition process, the current references and implementing directive; and the unique aspects of joint programs. The manner in which these aspects relate to the development, implementation and modification of an acquisition strategy in a major acquisition will also be presented. Section 2.0 addresses the development of Acquisition Strategy, Section 3.0 discusses ten major strategy issues, and Section 4.0 summarizes this chapter of the guide.

Because no two programs are exactly alike, each requires a tailored acquisition strategy. A joint program offers another dimension of the acquisition strategy for management consideration. A joint program strategy can be structured from the beginning if the proper multiservice requirements can be negotiated. DoD Directive 5000.1 requires that "acquisition of equipment satisfying DoD component needs should also include consideration of interservice and intraservice standardization and interoperability requirements." This consideration should be made prior to the issuance of a Secretary of Defense Decision Memorandum (SDDM) specifying a lead service and providing explicit guidance on the responsibilities of the participating services.

Figure 4-1, from the Program Manager's Notebook [1/], illustrates the differences between Acquisition Strategy, which provides the conceptual framework the PM will follow and the Acquisition Plan which is prepared by the contracting office and is more activity and issue oriented. Table 4-1, also from the Program Manager's Notebook,[2/] illustrates a comprehensive list of Acquisition Strategy elements.

2.0 DEVELOPING THE ACQUISITION STRATEGY

Acquisition strategy defines the interrelationship between management, technical, business, resource, force structure, support, testing, and the aspects of the program.

The primary value of strategic planning is the interactive process through which the final product is developed. The acquisition strategy evolves through repetition as a dynamic management tool which must be kept current throughout the life of the program. It must also address typical management issues from development to production that assess the impact of different levels of funding problems in testing, changes in requirements, control of engineering changes, length of product maturation, and effects of lead time. The acquisition strategy should delineate realistic responses to program variances considered disruptive to key program efforts.

The acquisition strategy should reflect the full scope of the program with sensitivity to the acquisition process, imagination, and practical judgment of program managers. Whenever large procurement quantities and relatively high unit costs are part of the acquisition, the program manager has a full range of acquisition strategies available to structure the program. The PM should also make maximum use of competition to obtain the trade-offs between cost, performance, schedule, and supportability to the best advantage of his program where there is a net benefit to the government

The Army, Navy, and Air Force each address acquisition planning and strategy

	PURPOSE	FORMAT	RESPONSIBILITY OF	WHEN PREPARED	WHEN APPROVED	AUTHORITY/ ACCOUNTABILITY CHANNELS	POLICY/ PROCEDURES SOURCE DOCUMENTS
ACQUISITION STRATEGY	PROVIDES CONCEPTUAL BASIS OF OVERALL PLAN THAT PM FOLLOWS IN PROGRAM EXECUTION	• PRESCRIBED BY EACH SERVICE • TAILORED TO EACH PROGRAM	PROGRAM MANAGER	DURING CONCEPT EXPLORATION PHASE	EARLY IN ACQUISITION PROCESS • ON OR ABOUT MS I • REVALIDATED AT EACH MILESTONE	SERVICE ACQUISITION DECISION PROCESS CHANNELS E.G., (S)SARCs, NPDM	A-109 DODD 5000.1 DODI 5000.2 SERVICE ACQUISITION REGULATIONS
ACQUISITION PLAN	COORDINATE AND INTEGRATE EFFORTS TO FULFILL SERVICE NEED IN A TIMELY MANNER AND AT REASONABLE COST .	• PRESCRIBED BY FAR/DFAR • STANDARD FOR ALL PROGRAMS	PROGRAM MANAGER	PRIOR TO EACH ACQUISITION PHASE OR MAJOR CONTRACT	• ON OR ABOUT EACH MS • PRIOR TO RELEASE OF RFP	HCA CHANNELS	FAR DFAR

Figure 4-1 Comparison of Acquisition Strategy and Acquisition Plan

TABLE 4-1 ACQUISITION STRATEGY ELEMENTS

ELEMENTS OF A-109 ACQUISITION STRATEGY	ELEMENTS OF FAR ACQUISITION PLANNING (PART 7)	ELEMENTS OF AIR FORCE PROGRAM MANAGEMENT PLAN (AFR 800-2.3)
• Contracting Process • Scheduling of Essential Elements • Demonstration Test and Evaluation Criteria • Content of Solicitations for Proposals • Decisions on Whom to Solicit • Methods for Obtaining and Sustaining Competitors • Guidelines for Evaluation and Acceptance or Rejection of Proposals • Goals for Design-to-Cost • Methods for Projecting Life-Cycle Costs • Use of Data Rights • Use of Warranties • Methods for Analyzing and Evaluating Contractor and Government Risks • Need for Developing Contractor Incentives • Selection for the Type of Contract Best Suited for Each Stage in the Acquisition Process • Administration of Contracts	ACQUISITION BACKGROUND AND OBJECTIVES • Statement of Need • Applicable Conditions — Requirements for compatability with existing or future systems or programs — Any known cost, schedule, capability, or performance constraints • Cost — Life-cycle cost — Design-to-cost — Application of should-cost • Capability or Performance • Delivery or Performance-Priced Requirements • Trade-Offs • Risks PLAN OF ACTION • Sources • Competition • Source-Selection Procedures • Contracting Considerations • Authority for Contracting by Negotiations • Budgeting and Funding PRODUCT DESCRIPTIONS • Priorities, Allocations, and Allotments • Contractor Versus Government Performance • Management Information Requirements • Make or Buy • Test and Evaluation • Logistics Considerations — Assumptions determining contractor or agency support. — Reliability, maintainability, and quality assurance requirements, including any planned use of warranties. — Requirements for contractor data (including repurchase data) and data rights, their estimated cost, and the use to be made of the data. • Government-Furnished Property • Government-Furnished Information • Environmental Considerations • Security Considerations • Other Considerations • Milestones for the Acquisition Cycle • Identification of Participants in Acquisition Plan Preparation	• Program Summary and Authorization • Intelligence • Program Management • System Engineering • Test and Evaluation • Communications/Electronics • Operations • Civil Engineering • Manpower and Organization • Personnel Training • Security • Directives Application

TABLE 4-1 ACQUISITION STRATEGY ELEMENTS
(Continued)

ELEMENTS OF ARMY ACQUISITION STRATEGY (AR 70-1)	ELEMENTS OF NAVY ACQUISITION STRATEGY SECNAVINST 4200.33	ELEMENTS OF RECENT EXAMPLE ACQUISITION PLAN
• Program Structure • Contracting Strategy • Tailoring the Acquisition Process • Supportability • Manufacturing and Production • Test and Evaluation • Cost Growth and Drivers • Technical Risks • Safety and Health • Soldier-Machine Interface • Rationalization, Standardization and Interoperability (RSI) • Survivability and Endurance • Short-Term Issues	• Section I: Needs, Constraints, Thresholds, and Program Structure — Statement of need — Program constraints and/or thresholds — Resources and funding — Program structure • Section II: Risk Analysis • Section III: Strategy to Achieve Objectives and Implementation — Objectives and goals for the acquisition effort — Consideration and rationale for program schedule — Planning and control of critical program activities — Acquisition alternatives — The plan for selecting among alternatives and the timing of key selection decisions — The interdependence of the acquisition effort with other programs — Risk management plan — The approach for design, hardware data development, and Preplanned Product Improvement (P^3I) — Plans for achieving reliability in design and manufacturing — Standardization considerations — Design-to-cost and affordability considerations — Integrated logistics support approach — Use of organizational assets — Mobilization capability — A financial strategy — Plans for and funding required to acquire adequate subsystems and system test hardware — The business management approach — An audit trail of key acquisition decisions	• Program Description • Program Funding • Delivery Requirements • Applicability of Decision Coordinating Paper (DCP) and Defense Acquisition Board (DAB) • Background and Acquisition History • Program Risks • Integrated Logistics Support (ILS) Planning • Application of Design-to-Cost (DTC) • Application of Life-Cycle Cost (LCC) • Reliability, Maintainability, and Quality Assurance (R,M,QA) Objectives • Test and Evaluation Approach • Management Information and Program Controls • Approval for Full Production (AFP) • Gov ...nt-Furnished Pro ...ities/Component Bre. • Sho • In ...ss Planning • Oti ... • Acc ...es • Sch ...ting the Acqu • Acquis ...ticipants • Contracting ...ch • Long-Range Plan

development in slightly different ways. In the Army, Acquisition Strategy and Acquisition Plan are two separate documents. See AR 70-1 [3]. In the Navy, in accordance with SECNAVINST 4200.33,[4] the Acquisition Plan, as covered by Part 7 of the Federal Acquisition Regulation (FAR), satisfies the Acquisition Strategy requirements. Also, SECNAVINST 4210.6[5] provides Navy guidance in the area of Acquisition Policy and Srategy. For the Air Force, the acquisition strategy and acquisition plan are synonymous and are an integral part of the Program Management Plan (PMP) as prescribed by AFR 800-2, AFSC supplement to 800-2 and AFCP 800-3.

The acquisition strategy should include a listing of critical pacing technology advances required to satisfy the program thresholds. The initial acquisitions strategy after Program Initiation may only contain a few pacing technology advances required since alternatives have not yet been explored. As the concept formulation phase proceeds, however, advances should become defined in detail as the preferred alternatives are considered. The critical pacing technology advances required for each alternative drives the technology risk assessment in the analysis for the alternative concepts. Once the preferred alternative(s) is chosen at Milestone I, the advances required should be well known and an evaluation of risks for developing those technologies to the point of being able to meet the performance, cost, schedule, and supportability thresholds should be understood. The program manager must then manage these risks through the acquisition strategy by assigning and controlling critical resources (time, money, personnel) to achieve the required technology advances with special attention to the critical pacing technologies.

When technical risk and progress are acceptable, short-term fixed-price contracts are sometimes used to evaluate and explore selected concepts. This can aid in reducing technical uncertainties for alternative approaches. Unsuccessful approaches are eliminated by continuous tests of contractor and in-house laboratory efforts.

3.0 ACQUISITION ISSUES

The previous section presented a table of acquisition strategy elements as extracted from FAR, DAR, and OMB Circular A-109. These elements may be regrouped as lower levels of a structure called Acquisition Strategy Issues. The Acquisition Strategy Guide [6], has identified thirteen major issues which may be used to organize the multitude of acquisition strategy elements to be considered by the Joint Program Manager. Ten of these thirteen issues are synopsized below and modified where necessary to address the Joint environment.

Issue 1 - Competition. Defense competition can take many forms. These may be no competition, for example, where a sole-source procurement is directed or a selection is made because of the nature of the product and the availability of qualified sources. Where there is direct competition, it may involve two or more companies, and it may occur during research, development, or production of a product. Two generic forms of competition are recognized in military acquisition:

- Design Competition. Two or more companies develop conceptual or design approaches, one or more of which will be used for the production contract. The competition can be extended through the Demonstration and Validation phase and into the Full Scale Development phase to obtain prototype performance verification and to provide a natural competition for the production contract. Typically, in large programs

design competition ceases at Full Scale Development.

- Production Competition. Two or more companies bid to secure all or part of a production contract. Thus there may be a winner-take-all competition or the production may be split between two contractors. The competitors may have participated in the program prior to the first production contract, or one or more may have been brought in through a second-sourcing strategy.

The DSMC Handbook Establishing Competitive Production Sources[7] provides details. The approaches to establishing second sources for production have received the greatest attention, for it is in this phase that the major expenditures are made during acquisition. The following methods have been identified:

- Form-Fit-Function (F3). Only functional requirements and size, weight, and interface parameters are specified, permitting one "black box" to replace another. It is applicable with break-out.

- Technical Data Package. Data are purchased to enable qualified contractors to produce the equipment.

- Directed Licensing. This is similar to leader-follower except that the leader company is compensated for technology transfer through royalty or licensing fees.

- Leader-Follower. The system developer or sole-source producer furnishes assistance to a follower company to establish the latter as a second source. Since the leader company has a natural reluctance to lose its sole-source position, contractual commitments must generally be made at an appropriate time to ensure the viability of this approach.

- Contractor Teams. Teams of individually competent contractors bid for the development contract, thus providing multiple qualified sources for the system during the production phase.

- Break-Out. A critical subsystem or component is selected for competitive production in out-year buys. A subsystem component that is broken out may become GFE.

Competition by several companies for the same system should always be considered in new systems acquisition. It is not always implemented, for a variety of reasons. However, there can also be indirect competition in that the mission need can be met by a substitute product or item requiring no further development. Examples are the C-5B and C-17 transports to meet the airlift mission, and KC-135 re-engine and KC-10 tankers to meet the air refueling mission. Some leverage is thus maintained over contractors in that these mission competitors do compete for the same funding.

Issue 2 - Concurrency/Time Phasing. The acquisition cycle has been lengthening over the past decades, and concurrency (overlapping of task schedules) is one approach that is usually considered to shorten the time required to achieve an earlier Initial Operational Capability (IOC). However, the lengthening of the acquisition cycle has not been due to a lengthening development phase, but rather to longer times prior to development and longer production spans after development. Concurrency that requires the overlapping of Full Scale Development (FSD) activities in design, test and evaluation, and production and deployment can increase the risks of not achieving performance, schedule, support and cost objectives. This is true particularly when testing an initial production and fielding of the equipment overlap considerably and

there is not sufficient time to use test results to correct design deficiencies.

One problem in determining the extent to which concurrency can be applied (how much compression in the schedule can be tolerated) is understanding the difficulty of the program before starting FSD. Consideration should be given to technology advances sought and complexity of the system relative to the desired IOC data and the amounts and types of testing required to reduce design uncertainty. On the one hand, IOC is desired as early as possible. On the other hand, sufficient time must be allowed for the FSD actvities leading to IOC. It may not be a matter of more money and people to shorten the time; certain activities cannot be accomplished very much sooner no matter how extensive the resources applied.

The transition from Full Scale Development to Production and Deployment is the most difficult period to manage, and thus a great burden is placed on the Government and industry management teams to accomplish all required activities within constrained schedule and cost. The usual approach is to conduct design, test, production, and deployment in a sequential manner, particularly testing leading to production, so that the information available from testing can be fully utilized to "mature" the design and finalize the production article. In this sequential case the total time can be much too long compared with the desired IOC if there is urgency in fielding the system. Compromises concerning activities and their durations involved in this transition will largely depend upon the unique circumstances of each individual program, or may be based upon past experiences of similar or analogous activities.

- Alternative Forms. Concurrency is the overlapping of design, testing, production, and deployment activities. The overlapping and elimination of phases in the acquisition cycle, as well as overlapping or eliminating activities within a phase, are also possible choices based on the urgency of need or maturity of the system. The pacing subsystem(s) and activities must be identified, and adequate time must be allowed for design and test. During Full Scale Development, there must be a commitment to production from the outset (*e.g.*, a National need), because test, production, and deployment decisions must be made much earlier during design and testing activities. The effects of concurrency on timely supportability must also be considered. A realistic evaluation of available technology and previous experience is critical. It may be necessary to simulate designs before testing in order to speed design decisions. Early testing is critical to the verification of design uncertainties but requires hardware delivery and test set-up, which can require considerable additional time and early resources.

Issue 3 - Data Rights. Section 27 of the FAR and DFAR addresses the issues of data and data rights. Data rights are the limitations placed on the Government in using technical data delivered as part of a contract.

There have been major studies in the areas of data and data rights, with the focus being placed upon a central issue of how much data the government should acquire rights to, and for what reason. Industry often takes the view that the total economic health of the country is improved by industry retention of rights, while the government is obligated to make sure that work which is funded by the government is available for all legitimate purposes, including competition.

The revised DoD rules regarding rights in technical data were published in the Federal Register in April 1987, with an

effective date of 18 May 1987. A version of rights in technical data to be used by all federal agencies, including NASA, but not the Department of Defense, was issued in May under Federal Acquisition Circular (FAC) 84-27. The current plan is for a uniform set of guidance to be developed and implemented by the end of September 1988.

There are two basic categories of data rights in the Federal Acquisition Regulation (Part 27): Limited Rights and Unlimited Rights where "Limited Rights" allows the government to reproduce and use the data within the government, but without the contractor's permission, the government may not disclose the data outside the government nor use it for purposes of manufacture. Other specific uses may be identified in the FAR Limited Rights Notice Clause and included as a solicitation provision or contract clause.

"Unlimited Rights" means that the government may use, disclose and distribute the data and have or permit others to do so also. The determination of what constitutes limited rights data and unlimited rights data is complex, but primarily based on who has paid for the development. In the civilian agency version of the rights rules, if the government contributed (funded) any part of the development, then the government should receive unlimited rights. Therefore, the unlimited rights restriction is based on full contractor funding of the development which resulted in the data. Herein lies the major difference between the civilian agency and DoD data rules.

With the publication of the revised data rights rules, there are now three categories of standard rights in technical data which are: Unlimited Rights, Limited Rights, and the new category, Government Purpose License Rights. The key difference between the civilian and DoD versions is that the contracting offices in the DoD case are allowed to determine whether unlimited rights are required even though the government is entitled to unlimited rights by virtue of contributing to the development. Since the policy of DoD is to not acquire more data rights than required, the new government purpose license rights may be applied in mixed funding situations. Government purpose license rights permits the government to use, duplicate or disclose the data for any government purpose including competitive procurement, but does not grant others to use the data for commercial purposes.

The term associated with limited use of software data is "Restricted Rights." Restricted rights permits the government to use the software with the computer for which it was acquired, even if the computer is transferred; to use it with backup computers; to make backup copies; and to create derivative software which will have the same restrictions.

The DoD policy on data is to acquire only such technical data rights that are essential to meet Government needs. The Program Manager must determine whether the expense of acquiring, storing, and maintaining data is justified.

For any contract, the Government has a legitimate need for data to support such functions as operation, maintenance, training, standardization, and logistics support. Of primary concern is the purchase of data to provide the capability to produce the item by sources other than the original manufacturer. This was part of the motivation for the Government Purpose License Rights.

When a sole-source production contract is awarded, the Government is placed in the position of having to depend on the contractor for additional units, spares, and modifications. To avoid such complete dependence, strategic planning can

include such options as competitive production, leader-follower, and licensing. Data rights are required to exercise options for avoiding sole-source dependence. If the contractor cannot or does not want to produce the equipment, the purchased data can be used to solicit other sources, or possibly the equipment can be produced in Government facilities. When the data being considered are proprietary, the expense of acquisition will generally be higher, especially if the Government sees a need for acquiring unlimited rights.

There are a number of issues associated with data rights. A subcontractor may refuse to deliver data pertaining to its product even though all prime contractor data fall in the category of unlimited rights. A process called Predetermination of Rights in Technical Data is used to identify and establish agreements on proprietary data.

Another related issue is patent rights. In its simplest form, it offers two possibilities:

- The contractor retains patent rights, and the Government receives a nontransferable license to use the patent.

- The patent rights are retained by the Government, and the contractor receives a nonexclusive license to use the patent.

Two related issues concern NATO RSI licensing and the Freedom of Information Act. United States companies find it difficult to obtain proprietary rights and to acquire European patents on equipments scheduled for NATO RSI production. However, because of the data rights policies of European countries, European contractors can obtain patent and technical data rights in both Europe and the United States much more easily.

The Freedom of Information Act is a potential source of concern for contractors. The Government has the sole authority to bar release of proprietary information under this Act (Exception Four). Recent court decisions concerning the Act and the lack of any control by the contractor could jeopardize the contractor's competitive position. Contractors may therefore be reluctant to provide complete data.

Issue 4 - Design-to-Cost. DoD Directive 4245.3 of April 6, 1983[8/] defines Design-To-Cost (DTC) as:

"An acquisition management technique to achieve defense system designs that meet stated cost requirements. Cost is addressed on a continuing basis as part of a system's development and production process. The technique embodies early establishment of realistic but rigorous cost objectives, goals, and thresholds and a determined effort to achieve them."

The DTC goal initially established is the average unit flyaway (or rollaway, sailaway) cost associated with an end item of military hardware. As the ability to translate operations and support cost elements into "design to" requirements improves, DTC goals and thresholds are derived from the total Life-Cycle-Cost (LCC) considerations.

The DTC process is directed toward controlling cost in an effort to modernize DoD weapon systems in sufficient quantities to provide a suitable deterrence and fighting capability at an affordable cost. Before the DTC process was established, weapon system costs had been rising at a rate much faster than inflation. The most common reasons cited for cost growth (in addition to quantity changes) in past programs were:

- Initially, poor estimates of costs.

- Cost escalation due to inflation.

- Cost growth due to changes.

- Overhead escalation due to reduced business/production, *e.g.*, changes in business.

DTC is one of the many tools available for establishing cost controls. An inherent part of the DTC process is the capability to evaluate the impact of performance trades to meet DTC objectives, goals, and thresholds. To be useful, DTC efforts need to be sufficiently flexible to accommodate program changes and provide an audit trail of the impact of these changes on DTC parameters.

The DTC concept includes several categories of cost controls.

- Design to Unit Production Cost (DTUPC). This was the original DTC application, and conceptually the easiest to understand and apply. By Milestone II, the Program Manager usually has established a DTUPC estimate stated in terms of a selected base year's dollars, production rate and total buy, and production start date.

- Design to Operating and Support Criteria (DTOSC). Approved values for selected O&S elements expressed either in dollars or by other measurable factors, such as number of maintenance personnel, spares, fuel, and others such as resource consumption, reliability, and maintainability.

- The Army also requires that the DTC program be implemented on software programs with a development cost of $40M or more.

Originally, DTC was applied only to major programs. DoD Directive 4245.3 has expanded the scope of the process by stating that the management and procurement principles are equally valuable for, and should be applied to, the acquisition of systems below the DAB level. The criteria for implementing DTC on less than major programs is that the program have a development design requirement and that the predicted production cost be $40M or more. DTC goals shall be established and controlled within DoD components for these systems in a similar manner. Approval authority for cost goals and changes to the goals will be maintained at a management level above the program or subsystem manager.

The applicability of DTC has also been broadening in the scope of costs considered. Originally, because of inadequate visibility of costs in the O&S areas, DTC was applied only to production costs - specifically, to the unit production cost of an article of hardware. However, the ultimate objective is to ensure that the system developed will have the lowest life-cycle cost consistent with schedule, support and performance requirements.

The DTC goals must accurately reflect the critical cost factors of the program, and they must be measurable, manageable, and useful to Government and contractor program managers. To be useful, the cost goals must be stated in constant dollars for some specified base year. Inflation or deflation indices required to convert then-year to baseline-year dollars should be specified when the goal is established. In addition, it is necessary to identify production quantities and rates and the delivery schedule. Since very few weapon system programs proceed through development and production unchanged, it is important to identify procedures and factors (such as learning curves) that can measure the progress toward achieving DTC goals if modifications are made in the production quantity rate or schedule.

The DTC goals discussed above are best suited for programs with relatively large

production quantities except for software programs. The DTC concept strategy can be effectively applied to one of a kind system also, but it must be tailored. In these types of programs, goals different from flyaway or unit production cost can be used. For programs with low production quantities or proportionally high development costs, total acquisition cost would be a better DTC goal. Programs with high O&S costs in proportion to the acquisition amount would call for DTC controls on the total life-cycle cost. The establishment of cost goals, the tracking of these goals and an active program to remain within the goals is especially critical in a Joint Program where budgeting and financial activities are more complex.

Issue 5 - Incentives. Incentives represent a contractual strategy to reward the contractor for meeting or exceeding defined goals and, in some cases, to penalize the contractor for failure to meet goals by not giving them the award fee. Incentives can be applied to any system or acquisition characteristic, including cost, schedule, performance, producibility, reliability, maintainability, and quality, and they can be applied at any phase of the program.

An incentive contract is used to motivate the contractor to meet or better target levels when there is uncertainty about the outcome and the contractor has some control over the outcome.

Most incentive contracts involve cost factors, as identified by the contract type, *e.g.*, Cost Plus Incentive Fee (CPIF) and Fixed Price Incentive Firm (FPIF). However, an increasing number of incentive arrangements are based on characteristics other than cost, particularly award fees and various forms of warranties and guarantees.

There are two broad categories of contracts: cost-reimbursable and fixed-price. For cost-reimbursable contracts, the contractor provides best efforts to meet the contract terms and conditions and the Government pays all of the allowable costs that meet the test of reasonableness. Risks to the contractor are minimal. For firm fixed price contracts, the contractor must provide the required product or service at a predetermined price, regardless of the actual cost. Contractor risks are much more severe. Cost-Plus-Fixed-Fee (CPFF) and the Firm-Fixed-Price (FFP) contracts represent the boundaries of the contract-type spectrum with respect to the contractor risk. Within these boundaries, there are a number of possible variations. The following are three of the more common contract forms with incentive features:

- Cost Plus Incentive Fee (CPIF). Used in advanced engineering, systems development, and first production contracts when uncertainties of performance preclude a fixed-price contract but are not so great as to require a cost-plus-fixed-fee contract. A target cost and a target fee are established, together with a minimum and maximum fee. Cost overruns and underruns are shared in accordance with a negotiated formula until the minimum or maximum fee is reached. There is no ceiling price.

- Fixed Price Incentive Firm (FPIF). Used in much the same way as CPIF, but where there is less uncertainty in establishing a total ceiling price. The FPIF has the same characteristics as CPIF except that a ceiling price is established and there are no minimum or maximum fees and there are no minimum or maximum fees negotiated.

- Cost Plus Award Fee (CPAF). A cost-reimbursement contract with a fixed (base) fee and an award-fee pool. Some or all of the award-fee pool is paid to the contractor as a reward for achieving performance in designated

areas above minimum acceptable levels. Management and performance are typical areas. The underlying theory of the award fee is to have the contractor earn extra profit rather than negotiate it.

Within each of these three major types there are numerous variations, such as varying share ratios and successive targets. In addition, there are multiple-incentive contracts, which attempt to balance performance, schedule, and cost objectives and risks.

Determining the need for an incentive contract, and the type to be used, depends on an accurate assessment of program risks. When risk is minimal and uncertainties are not extreme, a fixed-price contract may be appropriate, with or wthout incentives. Cost-type contracts are employed in greater-risk situations, typically in the research and development phases, when cost estimates are highly imprecise or technical and other uncertainties do not permit accurate assessment of future performance. From an acquisition strategy perspective, the Program Manager must act as follows:

1. Determine if an incentive contract form is a suitable alternative for each phase.

2. Acquire resources and data to investigate incentive potential further.

3. Select applicable incentive forms for each phase for selected cost/ performance/schedule parameters.

4. Establish basic guidelines for entering into final contract negotiations.

Issue 6 - Make-or-Buy. Make-or-buy, in its precise procurement meaning, refers to the program that identifies (and subsequential obtains) the major components, assemblies, and subassemblies to be manufactured by the contractor's own facilities and those which will be obtained elsewhere by subcontract. "Make" items can be produced by the contractor or its affiliate, subsidiary, or division; "buy" items come from subcontractors or suppliers.

The make-or-buy decision recognizes that few, if any, contractors can or want to fabricate all of the many components needed for a sophisticated, complex major weapon system in the time required, within cost limits, and at the required quality level. "Buy" decisions result in the inclusion of subcontractors and suppliers in the program. Subcontractor management can confront the Program Manager with a new set of problems. Other areas that the make-or-buy process can affect are associated with social legislation goals such as the use of small, women-owned or minority-owned business on Federal contracts. In general, make-or-buy seeks to accomplish the following:

- Assure the lowest program costs commensurate with necessary system requirements

- Restrain unfair prime or major contractor growth into areas where a sufficient mobilization base and cost information exists

- Effectively use Government-owned facilities

- Aid implementation of National social policies.

Although make-or-buy considerations normally focus on the narrower procurement-related definition, Program Managers should be aware of other types of make-or-buy alternatives that have a distinct effect on the selection and exaction of acquisition strategies. These alternatives are described in the following subsections.

Early in every program, the Program Manager must conduct an analysis that permits selecting the best method to satisfy mission requirements:

- New development program. The choice to "make" a new system is usually the most costly and involves the longest time for equipment deployment.

- Modification of existing, other services, or foreign items. This alternative combines "make" and "buy."

- Product improvement. This alternative exploits the growth potential inherent in already developed systems, thereby also mixing some "make" with "buy."

- Purchase of existing military (or commercial) domestic or foreign items. This "buy" alternative can provide low-cost, quick response to some requirements.

The effects of this issue on program planning, implementation, and success are profound. In this alternative, "make" refers to using GFE; "buy" refers to choosing GFE. Significant pressures exist in the following areas:

- Benefit. GFE can lower life-cycle costs, for three reasons:

  -Development should be complete.
  -There are production advantages due to larger purchases.
  -Standardization and commonality advantages should contribute to support cost savings.

- Risk. The use of GFE can increase program technical risk (if GFE is not compatible or does not meet performance guarantees); schedule risk (if GFE is late or defective); and cost risk (if GFE shortcomings or late deliveries result in program delays or changes). Some participants in the DD-963 Destroyer Program attribute the program's success to the conscious strategy of minimizing the use of GFE; other programs (*e.g.*, F-5E International Fighter) realized the full benefits of extensive use of GFE.

Government offices must analyze the proposed make-or-buy programs on the the basis of cost, cost realism, ease of management and overall benefit to the Government in accordance with the requirements of the April 1984, FAR 15.707 and DoD FAR Supplement.

From the contractor's viewpoint, the following are the reasons for "make" or "buy":

Make

- Develop capability, people, process
- Use idle capacity
- Maintain work force for future
- Retain ability for close supervision
- Facilitate process and change control
- Minimize transportation problems
- Retain confidential designs or process secrets
- Reduce dependence on outside sources of supply

Buy

- Technical know-how lacking
- Investment in equipment, tools, or equipment not justifiable
- Volume required too large or too small
- Risky market demands better handled by specialty supplier
- Better quality available from outside supplier
- Basis provided for checking in-house costs
- Patents or trade secrets involved
- Reciprocity possible

Issue 7 - Multiyear Contracting. Multiyear Contracting (MYC) or Multiyear

Procurement (MYP) is a method of acquiring more than one year's, but not more than five years' requirements, under one contract. Each program year is budgeted and funded annually, but the commitment is for at least several years.

Single-year contracting for major systems has been the usual method of acquisition for many years. The quantities are authorized and the funds are appropriated annually. Contractors are not willing to commit to expenditures for long-lead items, economical-order quantities, or equipment investment when they are not sure of future business. The DoD, industry, and GAO have all stated that this method of acquisition is inefficient.

MYC can be more efficient and less costly than single-year procurement by allowing or encouraging the following:

- quantity purchases for out-year deliverables
  - -Materials
  - -Components
  - -Subsystems
  - -Subassemblies
  - -Assemblies
- Efficient labor utilization over the life of the contract
- Contractor capital investment (*e.g.*, purchase of tooling or facilities to achieve cost efficiencies.)

The benefits of MYC are to reduce procurement costs and provide incentives for industry investment. MYC has been favorably viewed by Congress, industry, and the military. The Military Departments and industry have cited favorable experience to date.

- Cost savings are realized by the use of MYC versus single-year procurements depending on the depth to which MYC is applied, *i.e.*, materials, components, subassemblies, or assemblies.
- Business is stimulated because more economical purchases from vendors and subcontractors are permitted; an incentive to invest in new equipment is provided; and there is orderly buildup, stability, and scaling back of personnel.
- A potential for meeting surge requirements develops in the second and subsequent years of the contract by virtue of the assured existence of the suppliers, subcontractors, and vendors.

The reasons for selecting MYC are to reduce costs, schedule activities more productively, and provide incentives for industry investment. If the program is not amenable to MYC after it is started, the option to terminate the MYC could entail substantial cancellation liability. Guidelines for MYC compatability were promulgated by the Deputy Secretary of Defense in a Policy Memorandum (1 May 1981).

The process of deciding to use or not to use a multiyear procurement for production programs as well as how best to tailor and structure MYP requires management judgment. The following criteria have been prepared as guidelines for decision-makers. The criteria are to be considered in a comparative benefit/risk analysis format where criterion 1 below, represents the benefit factor, and criteria 2 through 6 represent risk factors.

Guidelines for MYC

1. Benefit to the Government. A multiyear procurement should yield substantial cost avoidance or other benefits when compared to conventional annual contracting methods. MYC proposals with greater risk to the Government should demonstrate increased cost avoidance or other benefits over those

with lower risk. Savings can be defined as significant either in terms of absolute dollars or percentage of total cost.

2. Stability of Requirement. The minimum need (*e.g.*, inventory or acquisition objective) for the production item or service is expected to remain unchanged or vary only slightly during the contemplated contract period in terms of production rate, fiscal year phasing, and total quantities.

3. Stability of Funding. There should be a reasonable expectation that the program is likely to be funded at the required level throughout the contract period.

4. Stable Configuration. The item should be technically mature, have completed RDT&E (including development testing or equivalent) with relatively few changes in item design anticipated and underlying technology should be stable. This does not mean that changes will not occur but that the estimated cost of such changes is not anticipated to drive total costs beyond the proposed funding profile.

5. Degree of Cost Confidence. There should be a reasonable assurance that cost estimates for both contract costs and anticipated cost avoidance are realistic. Estimates should be based on prior cost history for the same or similar items or proven cost estimating techniques.

6. Degree of Confidence in Contractor Capability. There should be confidence that the potential contractor(s) can perform adequately, both in terms of Government furnished items (material, data, *etc.*) and their firm's capabilities. Potential contractors need not necessarily have previously produced the item.

Issue 8 - Phased Acquisition. Phased acquisition of major systems must now include a Low-Rate Initial Production (LRIP) Phase in transitioning from Full Scale Development to Production and Deployment, including Operational Test and Evaluation (OT&E) under the auspices of the Director, Defense Operational Test and Evaluation. The premise is that production articles can benefit from development design changes and test results and from initial low-rate production and early operating experience, such that it is worthwhile to delay high-rate production and full deployment of the system for some period. The system life-cycle cost is expected to be lower because of corrections of deficiencies early in production and deployment and the reduced need to correct production articles on the production line and in the field. The LRIP phase also allows sufficient time for a second production source to produce an "educational" lot, while holding the primary source from moving too far down the learning curve and obtaining a large competitive advantage.

Phased-acquisition alternatives might also include consideration of warm production base, cold production base, and production breaks, but these are usually used to protect production sources once a system has been produced and deployed. For the consideration of Acquisition Strategy, this section will focus on LRIP.

Phased acquisition addresses the problem of an immature design reaching production and being fielded before it is ready. The transition from development to production and deployment is the most difficult activity to manage. Concurrent activities are proceeding in testing, correction of design deficiencies, and initial production and deployment of the system. Phased acquisition is intended to ensure that the system is close to a final production article before full production is implemented. It addressed the problem of overcoming early deficiencies

discovered in design and testing and in the field, and correcting those deficiencies prior to full production and field deployment, thereby causing the least perturbation to the overall procurement and deployment plan.

Phased acquisition is most beneficial for a technologically advanced, highly complex weapon system for which time is needed to mature the design and provide test information and early production and field deployment experience, and where initial low-rate production facilitates achieving the program objectives. It provides design, test, producibility, and operational information while holding down the cost of production line and field retrofit. It can also be used to initiate a competition using a second production source. In formulating an acquisition strategy, the selection and timing of an initial production rate, whether sole-source or competitive, and the time allowed to transition to full rate must be appropriately integrated with the design, test, and production activities.

Phased acquisition requires the following:

- Clear management direction that this is the approach that will be pursued
- A tendency toward an austere initial development
- Intense early performance testing and operations to obtain data to mature the design
- Feedback and analysis of early test and operational data to mature the design prior to full production
- Realism concerning the technology assessment and schedule flexibility

Phased acquisition provides an opportunity to obtain more test data and early production and field operating data with which to correct deficiencies prior to high-rate production. It provides early visibility and timely information to reveal and correct performance and support problems; at the same time it reduces the number of units requiring retrofit in production and in the field. It also provides some flexibility in obtaining more information about uncertainties in performance and cost, while providing better information to enable more informed decisions. When high rate is approved more operationally ready articles are delivered to the field and life-cycle cost is lower. Modifications to fielded articles are more expensive than modifications made prior to production; configuration management is more difficult when more deficiencies are being corrected; and inventories require the stocking of a greater variety of part types and more parts if more deficiencies are being corrected. Therefore, even though the full operational capability schedule may appear to be longer, the date at which a specific level of capability is achieved might actually be earlier.

Phased acquisition requires a longer program schedule and thus delays full operational deployment. Earlier production units will be more costly because of lower production rate. During periods of high inflation, time delays could seriously perturb the funding stability of the program and increase costs. Longer exposure to annual incremental funding could jeopardize the continuation of the program, for various reasons (*e.g.*, technical, political) as it moves through the acquisition process.

Issue 9 - Preplanned Product Improvement. Preplanned Product Improvement (P^3I) makes it possible to develop and field a new weapon system while improvements to that system are being planned for phased integration. P^3I has been defined as a systematic and orderly

acquisition strategy beginning at the system's concept phase to facilitate evolutionary, cost-effective upgrading of a system throughout the life cycle to enhance readiness, availability, and capability.

Since the early 1950s, the acquisition philosophy for weapon systems has been predominantly one of pushing the state of the art. Once a threat has been validated, the technology for countering that threat is developed, thereby enabling a weapon system to be developed and deployed. If a technology or threat change occurs during the development of the weapon system, one of two actions can be taken in response to the change: (1) redesign the weapon system to incorporate the change, or (2) continue the development to deployment as originally designed and plan to modify the system later in the field.

Both of these approaches can be costly to implement, and complete success in meeting a new threat may not be achieved. On the other hand, starting the development with a system requirement designed to meet probable future threats may induce unacceptable risks if the required technology is not available. P^3I affords a means of meeting the current threat and making plans for meeting probable future threats or improving the system as technology becomes available, without having to develop a new system.

P^3I also addresses a related problem - that of trying to incorporate a number of available but new technologies all at once. The technological problems that can result from trying to do too much too soon can lead to serious management and resource difficulties as unexpected interface, reliability, support, and other deficiencies emerge.

Product improvement (PI) is sometimes confused with P^3I, as is Planned Product Improvement (PPI). Product improvement is applied when a system is in the field and changes or corrections must be incorporated to overcome problems. Planned product improvement represents a change to the system that is generally anticipated but that the basic system was not originally designed to accommodate. Examples include the upgradings of the Polaris, Minuteman, and Pershing missile weapon systems.

P^3I differs from PI and PPI in that it is planned evolutionary growth. The need for eventual modification is recognized during the early development stages, and the acquisition strategy is designed to include provisions for ensuring that these modifications can be effectively introduced. Specific design strategy applicable to P^3I include modular design, a carefully architectured interface system, and inclusion of reserves for space, weight, power, and cooling. The system development process must include strategy and plans for communicating system growth requirements and for identifying new technological opportunities.

The following advantages result from an effective implementation of P^3I:

- Responsiveness to threat changes and future technology development
- Earlier IOC date for baseline system
- Reduced development risks
- Potential for subsystem competition
- Enhanced operational capability for "final" system
- Stimulation for laboratory and IR&D research
- Increased effective operational life

Possible disadvantages of using the P^3I concept include:

- Increased nonrecurring cost during initial development
- Increased technical requirements in such areas as space, weight, power, and cooling
- Increased complexity in configuration management
- Vulnerability to "gold plating" criticism and funding cuts
- Compounding of the system management problem because of parallel developments
- Interference with the orderly development and implementation of effective support plans and procedures

Issue 10 - Source Selection. Source selection is the process wherein the requirements, facts, recommendations, and Government policy relevant to an award decision in a competitive procurement of a system/project are examined and the decision is made.

DoDD 4105.62, Selection of Contractual Sources for Major Defense Systems,[9] emphasizes that the prime objectives of the process are:

- To select contractors that can best meet the Government's needs, pursuant to the solicitation
- To ensure the impartial, equitable, and comprehensive evaluation of each offeror's proposal
- To ensure the procedures employed for source selection are flexible and tailored to the requirements of the specific acquisition so as to minimize the cost of the process to Government and industry

The 1985 revision of DoDD 4105.62 includes a major section dealing with acquisition strategy. An important point is that the stratagem is acknowledged to be evolutionary, reaching a state of definition sufficient to manage all elements of the acquisition prior to the release of the initial solicitation.

Source selection addresses a rather clearly defined problem, faced several times during the life of a system program: which contractor source or sources will provide the most beneficial product or service to the Government. Source selection itself may present problems for the Program Manager in terms of execution, but its applicability is not at issue. Although there are alternative forms of source selection, contracting specialists will help recommend the appropriate form for each solicitation on the basis of such factors as program size, technical complexity, and a number of sources. Source selection is especially critical at Milestones I and II; Milestone III and subsequent production source selections can be important if a multiple-source strategy is followed to maintain competition.

Several criteria affect the format of the source-selection process:

- Clarity and completeness of the requirement. Competition for products (and services) that are similar to describe and price may result in a formal advertising approach, whereas negotiated procurement is usually chosen in more complex solicitations.
- Size of procurement. Full DoDD 4105.62 procedures are required for major programs. Lesser programs can use more streamlined service processes.
- Urgency of requirements. Occasionally, the military necessity enables extraordinary tailoring of the selection process.

Care must be taken to ensure that the essential objective of an impartial, equitable, and comprehensive evaluation is not compromised. Because of this, the Program Manager is strongly urged to have the advice and counsel of procurement officials in planning or executing source selections.

The Program Manager's major analytical task is to ensure that the source-selection approach provides the best possible communication of what the Government needs and what industry can provide. The following are some of the ways in which this communication process can be helped.

- Thorough risk analysis. This is undoubtedly the key first step once the requirements have been established and validated. The analysis will identify the critical areas of technical and cost sensitivity for inclusion in the solicitation package.

- Integrated and simultaneous preparation of the RFP, SSP with evaluation criteria, and a model contract.

- Release of draft RFPs to industry well in advance of formal release date.

- Use of "Internal Review Boards" at field and system command levels.

4.0 SUMMARY

The selection and proper adjustment of a sound acquisition strategy can result in the much more efficient execution of the already difficult joint program. Major points presented above include:

- All programs require a tailored and modifiable acquisition strategy;

- Acquisition strategy is normally considered the plan for program execution, while the acquisition plan is more activity oriented, although the three services differ slightly;

- The evaluation of technical risk and its impact on the acquisition strategy is of constant concern to the Program Manager; and

- The following acquisition issues were addressed:

  -Competition,
  -Make or Buy,
  -Concurrency,
  -Multiyear Contracting,
  -Data Rights,
  -Phased Acquisition,
  -Design to Cost,
  -PrePlanned Product Improvement,
  -Incentives, and
  -Source Selection.

FOOTNOTES AND REFERENCES:

1/ "Program Manager's Notebook," Defense Systems Management College, October, 1985, p. 3.1c.

2/ "Program Manager's Notebook," Defense Systems Management College, October 1985. p. 3.1e.

3/ Army Regulation AR 70-1, System Acquisition Policy and Procedures, 12 November 1986.

4/ SECNAVINST 4200.33, "Selection of Contractual Sources for Department of the Navy Defense Systems."

5/ SECNAVINST 4210.6, "Acquisition Policy."

6/ "Acquisition Strategy Guide," Defense Systems Management College, 1 July 1984.

7/ Defense Systems Management College Handbook, "Establishing Competitive Production Sources," August 1984.

8/ DoD Directive 4245.3, "Design to Cost," April 1983.

9/ DoD Directive 4105.62, "Selection of Contractual Sources for Major Defense Systems," September 1985.

CHAPTER 5
PROGRAM REVIEWS

1.0 SYNOPSIS

This chapter discusses the reviews conducted by the services and DoD that evaluate programs during the acquisition of military systems. A joint acquisition program manager, in particular, must understand that the continued existence and progression of a program from one acquisition phase to another will be the direct result of successfully accomplishing the reviews. Program review rationale is provided in section 2.0. Joint program milestones and reviews are presented in section 3.0 and the flexibility of Milestones II and III is discussed in section 4.0. Next, specialized management for selective high-priority programs is presented in section 5.0. Service program reviews are highlighted in section 6.0. Preparation for the Defense Acquisition Board (DAB) is presented in section 7.0, followed by a discussion of program assistance and support in section 8.0. Finally, a summary of the chapter is provided in section 9.0

2.0 PROGRAM REVIEW RATIONALE

The objectives of the program reviews are to determine that an acquisition program is viable, valid and cost effective as it progresses through the acquisition process. The reviews present opportunities to conduct balanced assessments of the risks and uncertainties associated with a program at the completion of specific acquisition phases. Not only must the upper echelons of authority of DoD and the lead service be satisfied with the review results, but also those of each of the participating services. Completion of preparatory steps, in a timely manner, prior to a program review is also essential and varies from service to service.

Program reviews have been established to be conducted at specific milestones in the acquisition that ensure all areas of risk and uncertainty of a program are carefully considered before a commitment is made to proceed to the next acquisition phase. Risk is defined as the condition of having outcomes with known probabilities of occurrence, not certainty of occurrence.[1/] Areas of risk pertaining to a program may include:

- *Technical Performance Risk.* Will the mean-time-between-failures be within acceptable limits?

- *Schedule Risk.* Is the acquisition schedule adequate considering the state-of-the-art and complexity of the system?

- *Cost Risk.* Considering the current priority of the program will newly revised cost estimates adversely affect the unit costs of the system?

Uncertainty, on the other hand, is defined as the condition of having outcomes with unknown probabilities of occurrence.[1/] Areas of uncertainty regarding a program may include:

- *Mission Uncertainty.* Does the threat, as originally assessed, still exist? Does the mission requirement adequately identify and balance or mitigate the threat?

- *Technical Uncertainty.* Are the technical objectives of the system feasible with respect to the time and resources available to be expended?

- *Program Uncertainty.* Is the acquisition management strategy consistent with program goals and resources?

- *Background Uncertainty.* What are the factors external to the program, *e.g.*, change in national goals, change in political or economic climate, change in DoD or service policy, which can affect the program? Are these impacts consistent with program objectives and resource commitment?

- *Logistics Uncertainty.* Will the system be supportable at deployment under the logistics philosophy and strategy in use?

The reviews are conducted independently of the Planning, Programming, and Budgeting System (PPBS) process, and evaluate only one program at a time. In addition, the reviews do not attempt to assign relative precedence among the programs reviewed by the review groups. However, during the mission conceptualization and requirement development, a determination must be made of the importance and urgency of the proposed program and of the costs involved in bringing it to fulfillment. These parameters will dictate the level of formal Office of the Secretary of Defense (OSD) and service management attention. Non-major programs, are also managed according to the precepts of the major program acquisition directives, but by service-unique methods.

3.0 JOINT PROGRAM MILESTONES AND REVIEWS

DoD Directive 5000.1 and DoD Instruction 5000.2 of 12 March 1986[2/3/] define the milestones for major acquisition program reviews. Figure 5-1[4/] presents the milestones and reviews for joint programs. The figure also identifies the primary documentation involved wtih each milestone. Major aspects of each milestone and applicable documentation are discussed further below:

Milestone 0 - Mission Need Determination

- The mission need determination is accomplished in the PPBS process based on the proposed joint programs Justification of Major System New Starts (JMSNS) that is submitted with the lead service Program Objectives Memorandum (POM) or with all participating services POMs as agreed in their Memorandum of Agreement (MOA).

- Subsequently, SECDEF provides appropriate program guidance in a SECDEF Decision Memorandum (SDDM) that will authorize the initiation of the next acquisition phase, including: establishment of program goals and thresholds, reaffirming established needs and program objectives; authorization of exceptions to acquisition policy; and direction and guidance to OSD, OJCS, and the participating services for the next phase of the acquisition. Most joint major systems new starts have a Defense Acquisition Board (DAB) review, from which a SDDM is generated.[5/]

Milestone I - Requirement Validation

- The Joint Program Manager will present a System Concept Paper (SCP) and Test and Evaluation Master Plan (TEMP) to the Defense Acquisition Board (DAB) for review.

-The SCP summarizes the results of the Concept Exploration Phase up to Milestone I and discusses the joint program acquisition strategy, including the identification of concepts to be carried into the next acquisition phase (Demonstration and Validation), and the reasons for the elimination of other concepts. Also included are the goals, thresholds and ranges, to be achieved and subsequently reviewed at Milestone II. See Enclosure 4 to DoD Instruction 5000.2 for the SCP format.[3/]

-The TEMP defines and integrates the test objectives, critical issues, system characteristics, responsibilities, re-

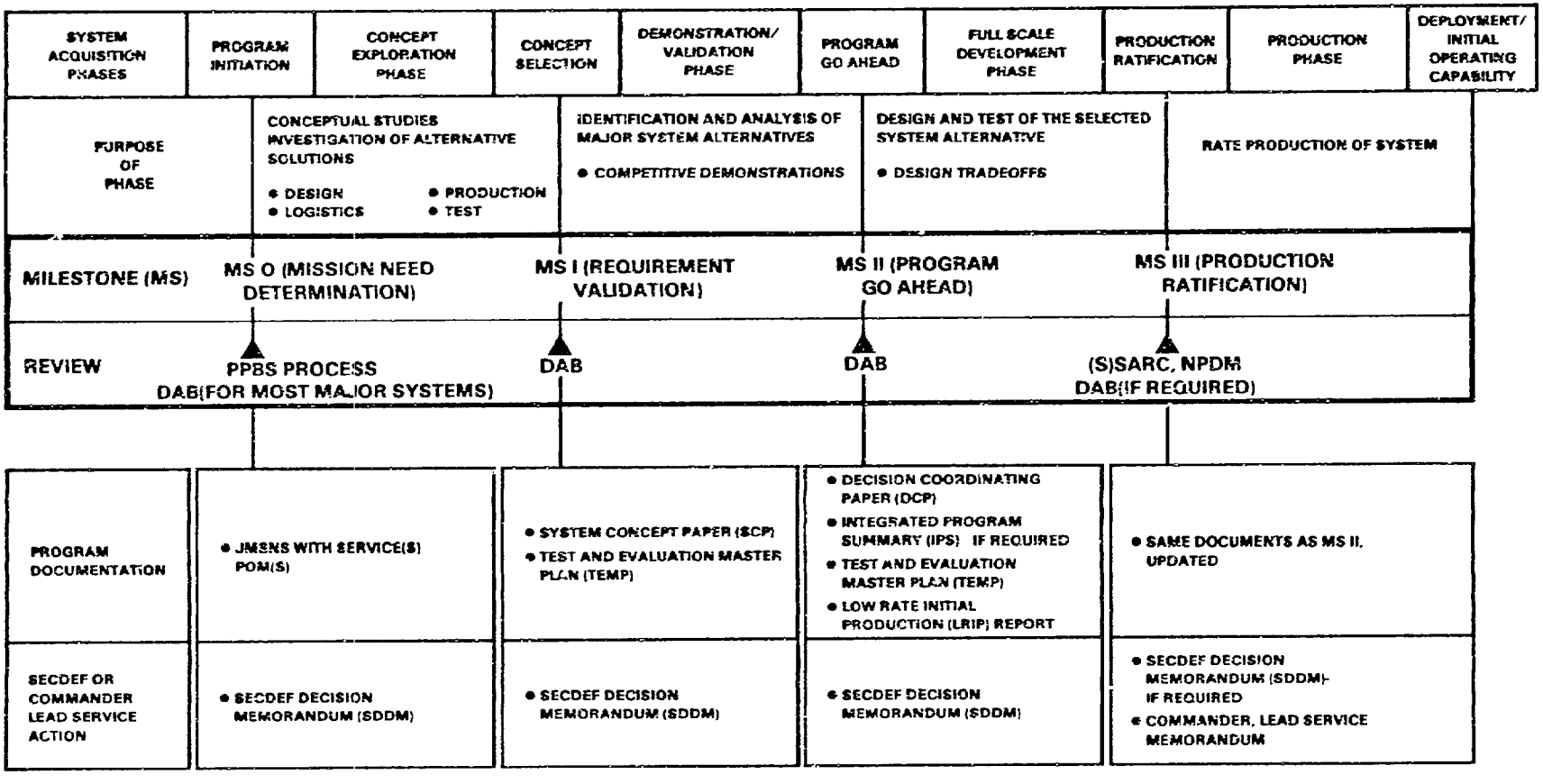


Figure 5-1 Joint Program Review Milestones [4]

sources, and schedules for the test and evaluation of the system.[6/]

Based on the DAB review, SECDEF will render a decision that will establish: thresholds and objectives to be met and reviewed at the next milestone; the acquisition strategy for the recommended concepts (including the nature and timing of the next SECDEF decision point); and a dollar threshold that cannot be exceeded to carry the program through the next milestone.

Milestone II - Program Go Ahead

- The Joint Program Manager will submit a Decision Coordinating Paper (DCP), an Integrated Program Summary (IPS), when required, and a TEMP to the DAB for consideration.

-The DCP is a top-level summary document that identifies alternatives, goals, thresholds and threshold ranges, as appropriate. See Enclosure 4 to DoD Instruction 5000.2 for the DCP format which is identical to the SCP format.[3/]

-The IPS provides more specific information on the program and should be prepared when the DAB Chair determines that the DCP lacks information on which to base a requisite decision.

-The TEMP submitted at Milestone I will be updated and expanded, as appropriate, and should define the T&E program for the full-scale development, for consideration by the DAB.

- In addition, a Low Rate Initial Production (LRIP) Report, prepared by the Director, Operational Test and Evaluation (DOT&E) should be provided to SECDEF and the Congress for review.[2/]

-The LRIP Report is an assessment of the adequacy of the OT&E and the effectiveness and suitability of a weapon system for combat. The report will be reviewed by the House and the Senate Committees on the Armed Services and Appropriations.

- Based on the results of the DAB and Congressional reviews, the SECDEF will issue an SDDM which may include a decision to proceed beyond the low rate initial production. Also, SECDEF may advise whether a DAB review will be required for Milestone III, or a (Service) Systems Acquisition Review Council (S)SARC or Navy Program Decision Meeting (NPDM) review will suffice.

Milestone III - Production Ratification

- The Joint Program Manager and the DOT&E will submit updated documents cited for Milestone II above to SECDEF and Congress, if a DAB review will be conducted at Milestone III. In the event that Milestone III will be accomplished by a service review, the Joint Program Manager and the DOT&E will submit the documents to the (S)SARC or NPDM chair, as appropriate.

- If a DAB review is conducted, SECDEF will issue an SDDM authorizing the program to proceed into Rate Production. In the event a service review is conducted the Commander of the lead service, in coordination with the participating services, will issue an appropriate memorandum similar to the SECDEF SDDM.

4.0 FLEXIBILITY OF MILESTONES II AND III

Normally, the Milestone II review will occur at the point where a program moves from the Demonstration and Validation Phase into the Full Scale Development Phase. However, in certain cases, it may be desirable to delay the Milestone II Review until additional development effort has been accomplished, or the review may be divided into two

reviews, IIA and IIB. The delay or dual review may be made to ensure that a better definition of system performance, IOC threat, cost, schedule, productivity, industrial base responsiveness, pre-planned product improvement (P^3I), supportability, and testing are accomplished. Accordingly, the refinement of the data facilitates the reduction of risk and uncertainty before the commitment of substantial resources toward full-scale development is made.

The Milestone III review may be divided into two reviews, IIIA and IIIB. The two reviews ensure that in-depth consideration is first given to the production aspects such as special tooling, long lead time items, and pilot assembly, and secondly, that an effective rate of production is established. In addition, an OT&E should be successfully conducted on a production-representative system to verify the system's operational effectiveness and suitability and ensure that it meets required operational thresholds when proceeding from Milestone IIIA to IIIB.

5.0 SPECIALIZED MANAGEMENT

A small number of high-priority programs are designated for Specialized Management. Such programs involve a limited number of systems that require a rapid response to operational changes throughout the system's life. Specialized management includes abbreviated reporting, coordination, review and budget procedures; waivers to Federal Acquisition Regulation (FAR), a range of enhanced security procedures authorized by DoD 5200.1R, including "Special Access Required" and increased reliance on contractor support. With these deviations, Specialized Management must be justified and wisely applied. A decision to authorize a Specialized Management program will consider the following factors:

a. Urgency of operational mission.

b. Urgency of the development, implementation and support necessary to meet requirements.

c. Security.

d. Quantity required.

e. Operational life of the program.

f. Contractor versus service support.

g. Applicability of military specifications to technical data, handbook, hardware and software.

h. Estimated cost-effectiveness of Specialized Management versus normal acquisition and support procedures.

6.0 SERVICE PROGRAM REVIEWS

Acquisition program reviews by the lead and participating services have impacts on joint programs. Perhaps one of the most difficult and complex tasks of the program manager is to gain timely concurrence from the participating services - particularly at the headquarters and secretariat levels. If a major commitment is to be expected from the participating service in a timely manner, a viable interservice review and coordination process must first exist. More importantly, the participating services must be made "participants" in the decision process if jointness is to be genuinely achieved. As a way of expediting the review process, the lead service may choose to conduct reviews in series or in parallel with the participating services. That is, the lead service may serially brief or review program milestones in-house to a certain management level, gain approval, then brief up the participating service chain of command to a comparable level, include other service comments and continue to the next

level. The parallel review approach simply provides the data to the participating service reviewers in parallel prior to lead service approval, incorporates comments as received and seeks concurrent approval from both review chains in order to continue to the next management level. Either method can be extremely time consuming if there are issues that cannot be readily resolved. An approach proposed and initiated by the INEWS joint program (Air Force lead) to promote involvement of the participating service, was to develop a Memorandum of Agreement (MOA) that required all AFSARC decision milestone reviews to be co-chaired by an appropriate Navy counterpart up to and through the SECNAV/SECAF levels. Furthermore, the Navy co-chairman was to cast an equal vote in the final decision. An appreciation of the various reviews conducted by each of the services is essential to effective joint program coordination. Accordingly, Tables 5-1 through 5-4 present a summarization of categories, review processes, and authority levels employed by the services for all acquisition programs.

7.0 PREPARATION FOR THE DAB

Preparation for the DAB requires months of dedicated effort and considerable interaction between the joint program office, the participating services and OSD, particularly during the three months prior to the DAB. The program manager must prepare documentation and brief OSD staff personnel, who critically analyze the data and provide feedback that improves the potential for a successful DAB review. A tentative schedule of events is presented in Table 5-5.[7/]

8.0 PROGRAM ASSISTANCE AND SUPPORT

The Joint Program Manager has more assistance available than does the single-service program manager. Participating service staffs and OSD not only request information, but also are valuable sources of information. A free flow of information will be mutually supportive, and the following offices are likely participants in any such exchange.

Air Force: The appropriate Program Element Monitor (PEM) in the Office of the Deputy Chief of Staff, Research Development and Acquisition (AF/RD) or Deputy Chief of Staff, Logistics and Engineering (AF/LE).

Army: The appropriate Department of the Army System Coordinator (DASC) in the Office of Assistant Secretary of the Army for Research, Development and Acquisition ASA(RDA).

Navy: The appropriate Deputy Chief of Naval Operations (DCNO) or Director who is the program sponsor or Director, Major Staff Office (DMSO), who is the program sponsor:

- OP-02 Submarine Warfare
- OP-03 Surface Warfare
- OP-05 Air Warfare
- OP-094 Command and Control
- OP-095 Naval Warfare
- OP-09B Research, Development and Acquisition

Marine Corps: The appropriate Development Program Officer (DPO) in the Office of the Deputy Chief of Staff for Research, Development, and Studies (MC-RD).

Department of Defense: The appropriate action officer in the Office of the Under Secretary of Defense (Acquisition) USD(A).

TABLE 5-1 AIR FORCE PROGRAM REVIEW BY ACQUISITION CATEGORY

TYPE OF ACQUISITION	PRIMARY CRITERIA	LEVEL OF APPROVAL	TYPE OF REVIEW	DECISION RECORDING DOCUMENT
DOD-designated Major Program	SECDEF-designated. Joint Acquisition. $200M FY80 RDT&E or $1B FY80 procurement costs.	SECDEF	DAB AFSARC	SCP
Air Force-designated Major Program	SEC Air Force-designated	SECAF	AFSARC	AF DCP
Non-Major Program	None of the above			See NOTE below.

NOTE: In addition to the program milestone reviews for DAB/AFSARC level programs, and solely for programs whose interest or priority is insufficient to warrant DAB/AFSARC attention, the Air Force employs periodic (vice program milestone) reviews, at which the PM/SPO or the AFSC Systems Officer presents the status of programs as follows:

— Highest Level:	SECAF Program Review (SPR)
	Program Assessment Review (PAR) by Air Staff
— AFSC Level:	Command Assessment Review (CAR)
— Product Division Level	Management Assessment Review (MAR) (generally less than $2M to achieve program objectives

In general, SPR/PARs, CARs, and MARs are held quarterly, with monthly updates to the SPR/PAR, CAR, MAR document. The level at which a program will be reviewed is more discretionary than cost-influenced.

TABLE 5-2 ARMY PROGRAM REVIEW BY ACQUISITION CATEGORY

TYPE OF ACQUISITION	PRIMARY CRITERIA	LEVEL OF APPROVAL	TYPE OF REVIEW	DECISION RECORDING DOCUMENT
DOD Major (PEO)	Program of significant interest, importance, or impact.Joint Acquisition. Threshold $200M FY80 RDT&E or $1B FY80 procurement costs.	SECDEF	DAB ASARC	SDDM SADM
Designated Acquisition Program (DAP) (PEO)	As directed by ASARC Chairman but not DOD-designated major program.	Army Acquisition Executive (AAE)	ASARC	SADM
IPR (PEO)	None of the above	PEO	IPR	SADM
IPR (Non-PEO)	None of the above	AMC System MSC	IPR	SADM

IPR — In-Process Review
SDDM - Secretary of Defense Decision Memorandum
SADM - System Acquisition Decision Memorandum
MSC - Major Subordinate Command
PEO - Program Executive Officer

TABLE 5-3 NAVY PROGRAM REVIEW BY ACQUISITION CATEGORY

	ACAT I	ACAT II	ACAT III	ACAT IV (M/T)
Program Decision Authority	SECDEF	SECNAV	DASN	SYSCOM CDR (PEO)
Decision Forum	DAB	NPDM II	NPDM III	NPDM IV
ACAT Criteria	Joint Acquisition $200M FY 80 R&D or $1B FY 80 Procurement or Both	$100M FY 80 R&D or $500M FY 80 Procurement or Special SECNAV Interest	Affects Military Characteristics or Interacts With Enemy	All Other Programs (IV T Requires COTF Involvement)
Documentation Required	JMSNS-Program Initiation SCP-Milestone I DCP/IPS-Milestones II & III and TEMP	OR-Program Initiation NDCP and TEMP	OR and TEMP	OR and TEMP
Milestone Review Program Initiation • Milestone 0	POM/PDM	POM	POM	POM
• Milestone I	SECDEF (SDDM)	SECNAV (SNDM)	POM	POM
• Milestone II	SECDEF (SDDM)	SECNAV (SNDM)	DASN	PEO Decision Memorandum
• Milestone III	SECDEF or Maybe Delegated to SECNAV	SECNAV (SNDM)	DASN	PEO-Decision Memorandum

TABLE 5-4 MARINE CORPS PROGRAM REVIEW BY ACQUISITION CATEGORY

	ACAT I	ACAT II	ACAT III	ACAT IV (M/T)
Program Decision Authority	SECDEF	SECNAV	DASN	DC/S (RD&S)(PEO) or DC/S (I&L)(PEO)
Decision Forum	DAB	MCPDM II	MCPDM III	MCPDM IV
ACAT Criteria	Joint Acquisition $200M FY 80 R&D or $1B FY 80 Procurement or Both	$50M FY 80 R&D or $250M FY 80 Production	05M FY 80 R&D or $20M FY 80 Production	All Other Programs (IV T Requires MCOTEA Involvement)
Documentation Required	JMSNS-Program Initiation SCP-Milestone I DCP/IPS-Milestones II & III and TEMP	OR-Program Initiation ROC and TEMP	ROC and TEMP	ROC and TEMP
Milestone Review Program Initiation • Milestone 0	POM/PDM	POM	POM	POM
• Milestone I	SECDEF (SDDM)	SECNAV (SNDM)	POM	POM
• Milestone II	SECDEF (SDDM)	SECNAV (SNDM)	DASN	PEO-Decision Memorandum
• Milestone III	SECDEF or Maybe Delegated to SECNAV	SECNAV (SNDM)	DASN	PEO-Decision Memorandum

TABLE 5-5 TENTATIVE PREPARATION SCHEDULE FOR DAB [7]

Tasks	Time Prior to DAB
1) Milestone planning meeting (optional). As determined by DAE or the joint program manager, an informal planning meeting held to identify program issues before submission of applicable draft documentation for the specified milestone review.	3 to 6 months
2) Draft program documentation. The SCP or DCP/IPS is submitted to the OSD action officer who distributes it to the DAB members.	3 months
3) DAE comments on draft documentation. The DAE transmits formal comments to the joint program manager and every effort is made to resolve any issues prior to the DAB review.	2 months
4) Final documentation update is submitted to the DAB.	3 weeks
5) Joint program staff briefings to OSD. The advisors then brief their findings on the program to other involved OSD personnel.	3 weeks
6) DAB pre-briefings. The OSD staff brief the DAB members on the joint system.	2 weeks
7) OSD staff reports sent to DAB members.	6 workdays
8) DAB Review DAB executive session*	0

* The executive session expedites the evaluation of the data presented to the DAB and facilitates the preparation and issue of the SDDM, approximately three weeks after the DAB review.

DASCs, program sponsors, DPOs, PEMs and action officers may have several projects to monitor, or only one. Army DASCs and Air Force PEMs are likely to have a single program. The Navy program sponsor, the Marine Corps (DPO), and the USD(A) action officers are likely to monitor many projects in their specific warfare disciplines. Consequently, more initiative is required to coordinate with these Navy, Marine Corps and USD(A) points of contact.

The Joint Program Manager's relationships with these monitors should be as open as possible. They are often called upon to make planning, programming or resource allocation recomendations to service secretariat or OSD decision-makers. While the program manager is concerned about trade-offs among the competing demands of system performance, cost, and schedule, they are answering queries and providing information and recommendations that can enhance or undo the program acquisition strategy. Prompt responses to their requests for information will make successful accomplishment of the program reviews much easier.

Furthermore, the Pentagon monitors associated with a developing joint program are likely to be much more knowledgeable about the various service-OSD interfaces than the program manager. Many of them will have processed MENS, DCPs, and SDDMS previously, and have experience with the incumbent principal decision-makers. They will be the sources of the understanding of the details behind the generalized DOD acquisition documents and of the areas where promulgated directives are not totally definitive. Some have detailed internal staff check lists and guides for use in the review process that could be of assistance. The new joint program manager can receive the benefit of this assistance and support through a cooperative relationship with these experienced professionals.

9.0 SUMMARY

- The objectives of program reviews are to determine that an acquisition program is viable, valid and cost effective as it progresses through the acquisition process.

- Program reviews are established at specific milestones throughout an acquisition to ensure that all areas of risk and uncertainty of a program are carefully considered before proceeding to the next acquisition phase.

- Risk is defined as the condition of having outcomes with known probabilities of occurrence, not certainty of occurrence.

- Uncertainty is defined as the condition of having outcomes with unknown probabilities of occurrence.

- Reviews consider one system at a time.

- Milestone 0, the Mission Need Determination, is accomplished in the PPBS process, utilizing the JMSNS submitted with the POM and the DAB review for most major systems before the system can commence the Concept Exploration Phase.

- Milestone I, the Requirement Validation, is accomplished through the DAB review. A SCP and TEMP are submitted for review before the program can move into the Demonstration/ Validation Phase.

- Milestone II, the Program Go Ahead, is also accomplished through the DAB review. A DCP, IPS, TEMP and LRIP Report are submitted for review before the program can proceed to the Full Scale Development (FSD) Phase.

The Milestone II review may be divided into two reviews, IIA and IIB or delayed to facilitate the development of data that will reduce the risk and uncertainty prior to the commitment of substantial resources for the Full Scale Development (FSD) Phase.

- Milestone III, Production Ratification, could be accomplished by a service review or by the DAB if determined necessary. Updated and expanded versions of the Milestone II documents are submitted for the Milestone III review. The Milestone III review may also be divided into two reviews, IIIA and IIIB, if necessary, to ensure that adequate consideration is given to production aspects of the acquisition at IIIA and that an effective rate of production is established at IIIB.

- Approval of Milestone 0 through II reviews are accomplished by SECDEF Decision Memorandums (SDDMs). Approval of the Milestone III review is provided through a memorandum from the Commander, Lead Service, or by an SDDM as appropriate.

- A small number of high-priority programs, that involve a limited number of systems which require a rapid response to operational changes throughout a system's life, may be designated for Specialized Management if adequately justified.

- Acquisition program reviews vary by service. However, an appreciation of the reviews is essential to effective joint program coordination.

- A tentative schedule of three to six months has been developed to assist the Joint Program Manager in preparing for a DAB review.

- Participating service staffs and OSD can be vital sources of information.

REFERENCES AND FOOTNOTES:

1/ "Risk Assessment Techniques - A Handbook for Program Management Personnel," DSMC, First Edition, July 1983, pp. B-5 and B-6.

2/ DoD Directive 5000.1, "Major System Acquisition," 12 March 1986.

3/ DoD Instruction 5000.2, "Major System Acquisition Procedures," 12 March 1986.

4/ Figure 5-1 is based on DSMC chart SE-T 1001 from "Program Manager," DSMC, Jan-Feb. 1983 Issue and revised to reflect DoD Directive 5000.1 and DoD Instruction 5000.2 of 12 March 1986, and DoD Directive 5134.1, "Under Secretary of Defense," 10 February 1987.

5/ The authority for the Defense Acquisition Board (DAB) is DoD Directive 5134.1, "Under Secretary of Defense," 10 February 1987.

6/ DoD Directive 5000.3, "Test and Evaluation," 12 March 1986.

7/ Table 5-5 is based on Table 1 of the "Program Manager's Notebook," Fact Sheet No. 1-6.

CHAPTER 6

ORGANIZATION AND STAFFING

1.0 SYNOPSIS

This chapter discusses the variety of organizational structures that exist in the joint acquisition program environment, and major aspects of staffing, particularly an integrated office. Section 2.0 discusses the rationale of creating a variety of joint program offices to meet the needs of a multiservice acquisition. In section 3.0, the establishment of joint service program offices is discussed. The various organizational structures of joint service programs are presented in section 4.0. Next, sections 5.0 through 8.0 provide insight into the personnel aspects of joint program offices. Finally, section 9.0 presents a summary of the significant points of the chapter.

2.0 JOINT PROGRAM OFFICE VARIATIONS RATIONALE

The joint program structure depends on the size and goals of the program, the phase of the program in the acquisition process, the agreed-to relationship among the participating services, the acquisition strategy for the program, and the role of OSD, JCS or the JLC in the program. There is a wide variety of joint program organizations as discussed in section 3.0 of Chapter 1. (Also see Table 1-1.) There is no standard for joint program office organizations. Each joint program manager must tailor the PM's organization to the mission, functional relationships with participating services and to the extent of the responsibilities of the joint program office. In addition, in the course of an acquisition program, management or organizational approaches may need to evolve from one category to another over the years due to a number of circumstances, such as increased top-level interest, revised mission priorities, funding allocation changes, etc.

Joint program offices normally require more personnel than typical single-service programs due to the greater need for coordination and the need for being aware of participating services' efforts. Joint service program efforts also require more diverse skills and specialties resident in the joint program office to handle the increased complexities of a joint acquisition. Grade structure of the joint program office tends to be higher because of increased responsibilities, and because the tasks require considerable knowledge of how each service operates. This is especially true in the logistics areas, as personnel tend to be specialized and many problems in inter-service logistics are manpower intensive. Current formal and service training is focused toward the parent service and therefore there is a considerable learning period of six to eight months, before an officer or civilian, knowledgeable in one service, can be effective in representing another service or joint services. In addition, the increased business management requirements of a joint program necessitate additional staff to maintain larger volumes of records, prepare separate briefings and to conduct additional budget exercises required by the participating services.

3.0 ESTABLISHMENT OF JOINT SERVICE PROGRAM OFFICES

As stated in section 3.0 of Chapter 2, joint program offices can and should be established through mutual agreements between two or more services whenever a mutual or similar need or requirements exists. Normally, the office, be it the Defense Acquisition Executive (DAE), JCS, JLC or one of the services, will initiate the joint program in the form of a memorandum designating a lead service and directing that service to charter a joint program. (See section 5.0 of

Chapter 2 for a discussion of charters.) Normally, the lead service will provide the program manager, however, there have been exceptions where a participating service was designated to provide the PM.

Joint service programs involve continuous, dynamic and complex processes with substantial areas for dispute. DoD Directive 5000.1 and DoD Instruction 5000.2 of 12 March 1986, and the joint regulation, AFSC/AFLC 800-2, AMC R 7-59, NAVMATINST 5000.10A provide only a basic framework on which to resolve interservice issues.[1/2/3/] Usually, resolution is accomplished through compromise and negotiation resulting in one or more Memorandums of Agreement (MOA) between the services.

4.0 JOINT SERVICE PROGRAM STRUCTURES

Joint service programs range from a loose structured organization to an integrated structured organization. Regardless of the initial structure, a program office assumes the organizational structure should be reviewed periodically to ensure that the most efficient and effective organization is employed to meet the needs of the program as it progresses through the acquisition process.[1/]

Normal Joint Service Program Offices. Many joint programs, especially small programs, are joint only because their goals are to satisfy joint requirements. For the most part, these programs are structured and managed as they would be if they were single-service programs. The participating service may assign a liaison officer or representative to the program office, or it may simply monitor the program. Normally, the interests of the lead service will dominate the program.

Jointly Staffed Program Offices. The jointly staffed program office is the structure most preferred by the services. In these organizations, the lead service usually provides the program manager, most of the program management staff, and administrative support. The participating services each contribute a deputy program manager and other military officers to the program management staff. Though not explicit about program structure, the Joint Logistic Commanders' Memorandum of Agreement (MOA) on "Management of Multi-Service Programs/Projects" (see Appendix A) assumes the creation of a jointly staffed program office, and most programs structured that way follow the guidelines of the MOA.

Multiple Program Offices. A number of joint programs are, in fact, multiple programs whose activities are coordinated. The degree and method of coordination vary from program to program, as does the principal source of program direction. Frequently, the OSD plays some direct role in the program's execution. Many joint programs in this category have unique management structures. Four examples of these structures are depicted in Figure 6-1. The structure shown in structure A of Figure 6-1 can be considered a joint program confederation. Each service manages its own program but exchanges information regularly with the other services. OSD sometimes orchestrates the efforts, dividing responsibilities among the services to eliminate duplication or to ensure that alternatives are explored. OSD direction and inter-service interactions are minimal.

The opposite is true of the joint program structure depicted in structure B in Figure 6-1. In it, a jointly staffed OSD program office is created. Subordinate project offices are staffed and administratively supported by the services. Program direction is provided by OSD.

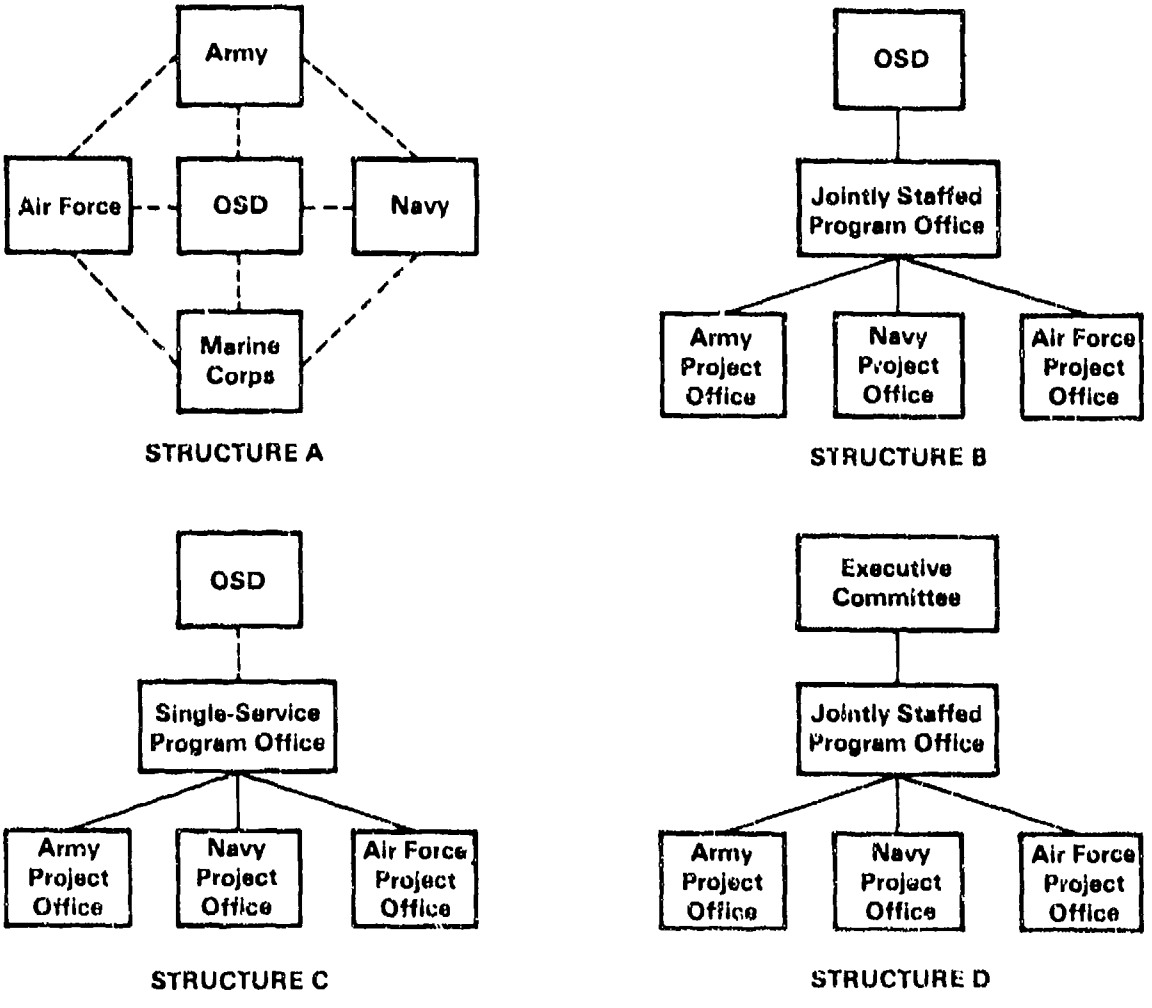


Figure 6-1 Structures of Joint Programs Having Multiple Program Offices

Structure C of Figure 6-1 shows a program structure that is similar to that in structure B. The difference is that instead of creating an OSD program office, one of the services is tasked to provide overall program management. Individual programs are managed by the services. Central control is less extensive than that exercised by an OSD program office, concentrating primarily on requirements, funding, and configuration.

Structure D depicts another variation of the structure B of Figure 6-1. Direction to the joint program office is provided by an executive committee comprised of senior representatives from each of the services participating in the program, as well as from OSD. Such an arrangement tends to moderate OSD control of the program, yet still provide strong, central program direction.

5.0 THE PROGRAM MANAGER

The lead service usually appoints the program manager, who should be of a rank commensurate with the size and importance of the program.[5/] The PM will be the primary advocate of the program and must manage the program towards the successful conclusion of the system acquisition.[6/]

6.0 PROGRAM OFFICE STAFFING

There are two basic alternatives for program office organization. One is to include all functional specialists needed for program execution in the program office staff, essentially establishing a self-contained organization. The other is to restrict the program management staff to a cadre of managers who draw functional support from the participating services, and function as a matrix organization. Most program management organizations are neither completely self-contained nor completely matrix, but a mixture of the two. Large, high-priority programs, especially in the Air Force and Navy, tend more toward the self-contained program office organization, depending less on small outside matrix resources; low-priority programs tend more toward the matrix type. The joint staff manning effort should include a configuration of agreed-to position types and numbers, their configuration and estimated duration of service. The personnel requirements should be specified as military or civilian and the service providing the resource. Sufficient time must be allowed in filling civilian requirements.

Joint programs normally follow the organization practice of the lead service. However, in a jointly staffed program office, it is normally desirable to include on the program management staff as much functional expertise as practicable. Supporting a joint program that has the active participation of two or more services is an extraordinary task. It is time consuming. Many of the services' normal procedures must be modified or abandoned in favor of procedures better suited to the program's needs. A functional specialist who is assigned full-time to the program management staff is more likely to share fully in the spirit and objectives of the program and to cling less fervently to service-peculiar procedures than is one who is working part-time for the program.

A complicating factor in the organization of a jointly staffed program office is the assignment of responsibilities to personnel from the participating services. The fact that the program office is jointly staffed is evidence of the participating services' desires to influence the program. However, it should be clear from the organization of the program office, as well as stated in the charter, that the participating services' representatives share responsibility for success of the joint program. They are not merely representing their services'

interests. To accomplish this, the joint program manager should organize the office staff and allocate key positions among the services such that a balance of responsibility, authority, and influence is maintained. Echelon parity among engineering, logistics, and procurement positions should be maintained as well. The senior representatives from the participating services must be in the chain-of-command, directly subordinate to the program manager. Sometimes this may require creating one or more positions for principal deputy program managers. Creating extra positions is preferable to rotating one position among the participating services or to slighting the interests of one by subordinating its representative to the other services'.

7.0 STAFF PERSONNEL SELECTION

One of the joint program manager's major challenges is creating an *esprit de corps* within the program office. Situations are bound to arise in which the participating services' interests conflict. Success of the program may then depend on having program management staff personnel who are committed to resolving the problem, rather than provoking confrontations. Staff members and representatives from the participating services can be expected to protect their services' interests; that may be why they are assigned to the program office. But their attitude and approach must be dedicated to success of the program.

The joint program manager will need the same type of personnel required by all staffs: knowledgeable, hard-working, efficient, and loyal. More than others, however, the joint program manager needs people who can work well with others and who are willing to explore unique solutions to management problems. The joint program staff must be creative, flexible, and determined.

Selection of the deputy program managers, especially those from the participating services, is particularly important to the joint program manager. The Deputy Joint Program Managers (DJPMs) have dual responsibilities, primarily to the parent service they represent and secondarily to the joint program. DJPMs are responsible for ensuring that the system being designed, developed or acquired will attain the performance reliability, availability and supportability requirements needed by the Service the DJPM represents. To accomplish such responsibilities, the DJPMs as well as the PM, must be acutely aware of the areas where their influence and authority are most important. In addition, both the PM and the DJPMs must work towards the ultimate success of the joint program while still endeavoring to achieve the requirement needs of their respective services. Not only must the PM have confidence in the abilities of the deputies, but the deputies must also be able to develop a good working relationship with the PM. Personality conflicts, even among people who are otherwise competent, can undermine a joint program. Before accepting assignment of key personnel, the program manager should interview them, discuss program objectives, management approach, and management philosophy, and be satisfied that each will become a part of a good management team. Such interviews, of course, would most certainly necessitate inclusion of interview parameters in the MOA, since it would seem a bit presumptive to assume that the services would permit another service to screen their handpicked candidate for a joint program office position.

With the passage of the Goldwater-Nichols Department of Defense Reorganization Act of 1986,[4] the *esprit de corps* in joint program offices should progressively improve as officers, with joint specialty designators, are assigned

and have prior training and/or experience in joint staff environments.

8.0 PERSONNEL EVALUATIONS

As a general rule, each person's performance should be evaluated by his/her supervisor. In joint programs, this rule can be followed for most personnel. The common exception is for military officers, assigned by a participating service to a jointly staffed program office. It is normally considered important to an officer's career for his/her performance to be evaluated by an officer of his/her own service. Therefore, in a jointly staffed program office, the participating services' senior representatives should be responsible for evaluating the performances of officers from their services.

The program manager, however, should always evaluate the performances of the participating services' senior representatives, even if they are evaluated also by the participating services.

9.0 SUMMARY

- There are a wide variety of joint program structures and organizations depending on the size and goals of the program, interest of OSD, JCS, or the JLC, participating services' involvement, etc.

- Each joint program manager must tailor the program office organization to function in the most efficient and effective manner. There are no standards for joint program office organizations.

- Joint program offices require more personnel than typical single-service program programs due to the greater need for coordination and interfaces with the various participating services.

- Normally, a learning period of six to eight months is required before new key personnel in a joint program office can function effectively, particularly where it involves other services.

- One of the major challenges for a joint program manager is to develop an *esprit de corps* within the program office. The *esprit de corps* should progressively improve as a result of the Goldwater-Nichols DoD Reorganization Act.

REFERENCES AND FOOTNOTES:

1/ DoD Directive 5000.1, "Major System Acquisitions," 12 March 1986.

2/ DoD Instruction 5000.2, "Major System Acquisition Procedures," 12 March 1986.

3/ Joint Regulation AFSC/AFLC R 800-2, AMC R 70-59, NAVMATINST. 5000.10A, "Management of Multi-Service Systems, Programs, and Projects," 4 Sept. 1973.

4/ "Program Manager's Notebook," Defense Systems Management College, Oct. 1985, p. 1.5.a.

5/ "Joint Major System Acquisition By the Military Services: An Elusive Strategy," GAO report NSIAD-84-22 of 23 Dec. 1983. p. 24.

6/ "Navy Program Manager's Guide," HQ, Naval Material Command, 1985, p. 2-1. ADA 151-925.

7/ "Goldwater-Nichols Department of Defense Reorganization Act of 1986," Public Law 99-433, 1 October 1986. Title IV - Joint Officer Personnel Policy.

CHAPTER 7

FINANCIAL MANAGEMENT

1.0 SYNOPSIS

Financial Management (FM) is an extremely important function and one which crosses all other facets of the program from early requirements determination (as related to initial affordability issues) to the final disestablishment of the Program Office or transfer of accountability for a specific weapon system. The Financial Manager (or Business/Financial Manager) will be involved in a wide range of resource issues including:

- Cost Estimating
- Contractor Performance Measurement
- Design to Cost
- Budgeting
- Funding
- Risk Analysis
- Proposal Evaluation
- Life Cycle Costing
- Financial Management Information Systems (FMIS)

Section 2.0 of this chapter will deal with the Joint Financial Management Function, Section 3.0 with cost estimating, Section 4.0 wth cost terms, and Section 5.0 with Financial Management Information Systems. Section 6.0 will summarize this chapter.

2.0 JOINT FINANCIAL MANAGEMENT

Recently, the issues of cost reporting and financial management have been receiving increased emphasis as a result of budgetary restrictions, Congressional reporting requirements, and the necessity for overall increased efficiency in acquisition management.

The baselining of selected major systems has been instituted to enhance program stability and control cost growth of selected major programs.[1/] Baselines are established for development and production, and address technical parameters, milestones and schedules, and cost estimates and goals. A cost cap, which is the maximum total dollar amount (program acquisition cost) which DoD is willing to commit for the capability being acquired, may be considered.

Selection and assignment of an experienced and knowledgeable Financial Manager is essential to establishment of a sound financial base for a Joint Service Program. Regardless of the official title, Fiscal Manager, Controller, Financial Manager or Business Manager, the financial management responsibilities are the same. They are pervasive, encompassing planning and control of all financial matters relating to programming, budgeting, allocating, committing, obligating, expending and accounting of funds, for salaries, for example, as well as actual equipment or system development. The financial manager must be on board and deeply involved in financial analysis and planning needed to establish program cost estimates, and be the principal architect on preparing the Joint Program Funding Plan. The funding plan should be keyed to the work breakdown structure and master schedule prepared by program analysts with the assistance of cost analysis experts, and must include a time-phased profile of funding requirements by type and source. The plan must lend itself to ease of breakout of funds by source,

particularly the "other" services planned contribution of funds, by type. Selection and assignment of a competent financial manager and development of a comprehensive funding plan are key first steps in establishing a sound business base for the Joint Service Program. Accordingly, the first critical task that must be accomplished by the financial or business manager is development of the funding plan.

A second critical task will be to establish procedures for controlling allocated funds which afford the joint program manager the utmost flexibility in executing program requirements and which are, at the same time, responsive to the financial management resonsibilities and priorities of the participating services. All obligational authority for the Joint Service Program should be transferred to the Joint Program Office or that office's present development/logistics command, even if some obligational authority is returned to the participating services. The Joint Program Office should use the financial management and accounting procedures of the lead service.

Programming and budgeting activities also should be centrally directed by the Joint Program Manager. Although the programming and budgeting processes in all the services follow the same general pattern and schedule established by the Office of the Secretary of Defense (OSD), practices do vary from service to service. Moreover, specific practices are likely to vary from year to year within any service. The Joint Program Manager or the PM's financial manager are not advised to attempt to become expert in the service-to-service variations. Where possible, and certainly in the case of a large program office staff, financial experts from each of the participating services should be included. When staffing authorizations or lack of available personnel preclude such staffing, the financial manager must establish and exercise close coordination with, and obtain timely assistance of controller and Headquarters Staff personnel in the participating services. Specific points of contact must be established and working relationships cultivated to ensure quick and decisive responses to financial management matters. Just as important is the matter of the Joint Program Office keeping the participating services informed (up-to-date) on financial status relating to allocation commitment and obligation of funds. In any event, the Financial Manager should ensure that program and budget submissions are compatible with the master schedule and joint program funding plan; that these come together at OSD as a joint funding requirement, and are justified before OSD, OMB and Congress as a joint program.

Joint Program Managers learn soon after assuming office that certain individuals outside their program office can expedite or impede their progress and that good working relationships with such individuals should be established at the outset. Among these people are the service comptrollers, at both headquarters and systems command levels. For instance, it is often the comptroller of the systems command providing support to the program office (e.g., Naval Sea Systems Command) who issues the budget call and the call for the annual program objective memorandum (POM) to which the joint program manager must provide inputs.

Most program managers have found it advisable to have frequent contact with the comptroller and, at all times, to be as forthright as possible in their relationship. For instance, if the Program Manager foresees a circumstance arising which might prevent the PM from obligating funds as planned, it is essential to so advise the comptroller. This is good insurance, for at some later date, the Program Manager may have a genuine

need for funds which the PM does not have. The PM is much more likely to get a sympathetic hearing from the comptroller if there has been cooperation in the past.

Other individuals outside the program office who can be of great help to the Program Manager are the action officers on the service headquarters staffs who monitor acquisition programs. (The titles and roles of these staff coordinators are discussed in Chapter 5, "Program Review"). In matters of planning, programming, budgeting and program review, the staff action officers can be instrumental in ensuring that the program's interests are well presented and that the services' internal administrative requirements are met in a timely manner.

Few joint programs enjoy single-source funding. Funding responsibility for most joint programs is shared by the lead and participating services. Whereas joint program direction often emanates from OSD, funding is provided by the services, subject to each service's assessment of its own funding priorities.

The funding arrangements for a joint program are normally defined in the program charter or in a memorandum of agreement (MOA) between the services. If neither of these is possible, the funding arrangements should be defined in MOA between the joint program manager and each of the services.

3.0 COST ESTIMATING

There is very little unique about estimating the costs of a joint program. Both the cost estimating requirements and the methodologies available for satisfying the requirements are the same as those for single-service programs. The procedures of the lead service should suffice, except for estimating the support investment and operating and support portions of life cycle costs.

The services operate in different environments, are organized to accomplish different missions, and support their forces differently. The implication of these differences is that support concepts and requirements for logistic resources vary from service to service, even when all the services are operating the same type of equipment. Estimates of support investment and operating and support costs must reflect those variations. For example, the equations used to estimate the cost of spare parts for an avionics equipment on an Air Force tactical fighter might include a war reserve spares kit (WRSK) to permit squadron level support of the system during the first 30 days of a deployment, however, the equations used to compute the cost of spare parts for an identical equipment on a Navy fighter might include requirements to support a 60-day, aircraft carrier deployment. The cost-estimating technique used by the joint program must be tailored to satisfy both requirements.

The Program Manager's Notebook[2/] provides an excellent synopsis of the following cost estimating methodologies: ANALOGY, ENGINEERING, PARAMETRIC, EXTRAPOLATION FROM ACTUALS. These techniques are normally associated with hardware estimating, but in today's acquisitions the area of SOFTWARE COST ESTIMATING is equally critical. The Program Manager's Notebook also addresses the subject of Software Costing.

ESTIMATING METHODOLOGIES.

Figure 7-1 shows a typical relationship between cost estimating methodologies and acquisition phase.[1/]

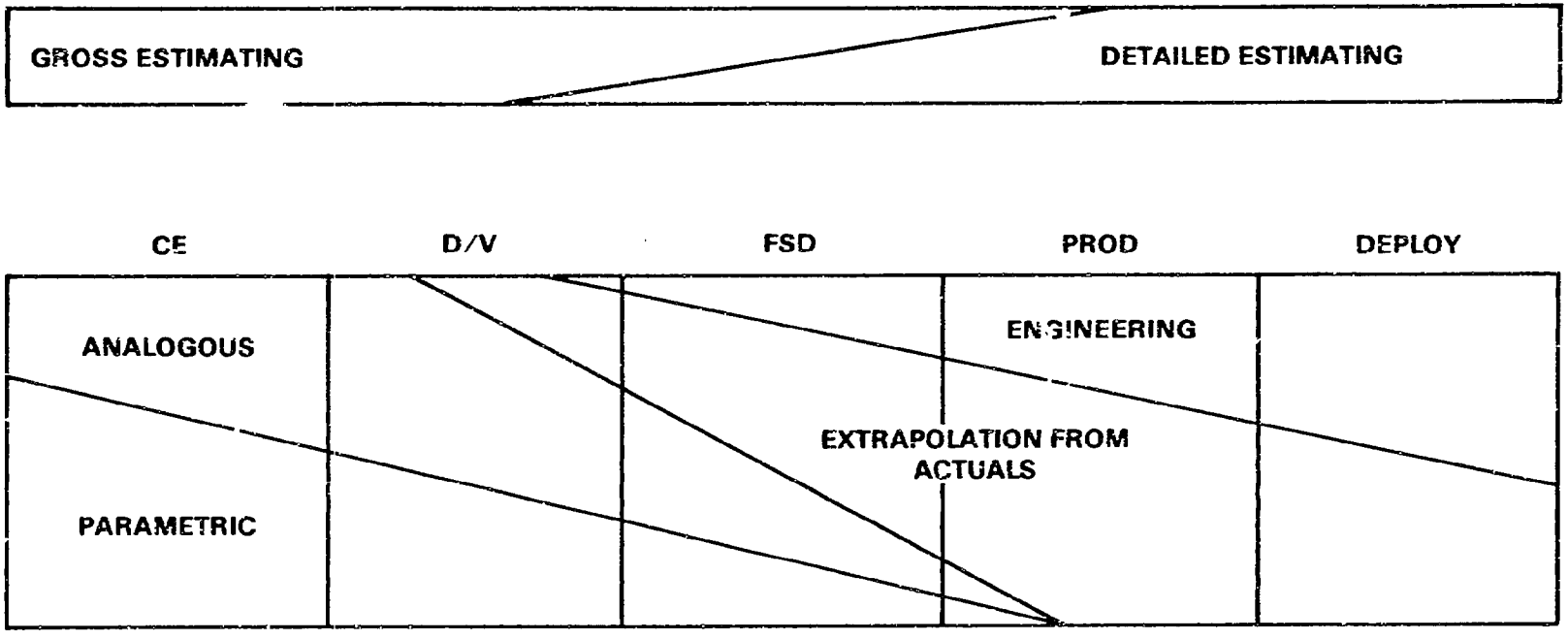


Figure 7-1 Estimating Methodologies

Analogy - Cost estimating by analogy is built around the premise that there exists a previously developed similar system, subsystem, or component for which cost, technical, and programmatic information exists. The methodology used to estimate the new system, subsystem, or component is to adjust the old item in terms of increased complexity, technical parameters, fiscal years, etc., and attempt to quantify these differences in terms of costs. This method is used early in the development process and therefore, there may be a great deal of subjective factors which will contribute to the estimating error. As an example, what does the statement, "twenty per cent more complex," mean in terms of cost? The cost estimator, working with the engineer, will have the responsibility to eliminate as much of the uncertainty as possible, and to identify where the remaining uncertainty lies.

Engineering - Engineering estimates are also known as "bottoms up" estimates, in that the direct elements of cost (direct labor, materials, other direct costs (ODCs), and applicable indirect burdens are calculated at the lowest task level possible. These low-level work breakdown structure estimates are then summed to yield the total estimate. The errors which are made in estimating the direct labor for a given task will compound itself because of the application of indirect burdens. Other problems arise in the estimation of the amount of technical risk, which can translate into rework and redesign. Primarily for this reason ENGINEERING estimating is most applicable to the production phase and subsequent changes to the system.

Parametric - Parametric cost estimating is widely used in government and industry because it relies on mathematical analyses of data and the development of a Cost Estimating Relationship (CER). A data base is required which can be used to relate cost to technical parameters, and then, from a set of cost and technical parametric relationships, a CER is derived. For example, there may be ten missile systems which can be organized into tables which show cost, weight, speed, and guidance type. From these tables, an equation can be derived which gives cost as a function of weight, speed and guidance type. This can then be used to estimate the cost of a new missile system.

Problems exist, however, in attempting to extrapolate beyond the range of the data or into new technological areas. Care must be taken to ensure that the factors for all the systems in the data base can be "normalized" to a common fiscal year, unit (first unit cost is normally used), and cost content (do the costs include transportation costs or not, for example.)

Extrapolation from Actuals - This is similar to the analogy method of estimating except the analogous system is a prior or even the system being estimated. Actual cost data is used and adjusted to reflect changes, in the case of a subsequent version, or used as the departure point to estimate the remaining cost of a system prototype, for example.

The method used in estimating the cost of a system should be based upon the amount of actual data available, the degree of commonality between the new system and the data, and a thorough understanding of the programmatic differences between the systems in the data base and the new acquisition.

SOFTWARE COST ESTIMATING

Software cost estimating is a complex and little understood area. A brief set of important issues are presented below in order to focus attention on the problem. One of the most widely used references on the subject is Software Engi-

neering Economics, by Barry W. Boehm[5], which should be required reading for software cost estimators. Some of the more important software items are:

- Underestimation of the size of the software development is a key factor in misestimation
- The definition of "size" is not standard in data bases
- There is little experience in costing new high level languages
- Software maintenance is extremely expensive and difficult to estimate
- The current trend in estimating is moving towards costing by function (target acquisition, data base inversion, etc.)
- Productivity rates may vary widely with language and function

The Financial Manager needs to be especially aware of estimated resources for software development and maintenance, and appreciate the potential for large cost uncertainties.

4.0 COST TERMS

There are seven cost terms which have definitions prescribed by DoDI 5000.33[6] which shall be used when submitting cost information to OSD for transmittal to Congress or other government agencies. These terms and definitions are as follows:

Development Cost - Development Cost includes:

(1) Work Breakdown Structure (WBS) elements of Major System Equipment, System/Project Management, System Test and Evaluation (except Operational Test and Evaluation funded from Military Personnel or Operation and Maintenance appropriation), Training, Peculiar Support Equipment, Data, Operational/ Site Activation and Industrial Facilities (when provisions of Chapter 251 of DoD Manual 7110.1-M[7] apply);

(2) RDT&E funded costs (i.e., conceptual, validation, full scale development phases from the point the program/system is designated by title as a Program Element or major project in a Project Element); and

(3) All costs, both contract and in-house, of the Research and Development cost category, including the cost of specialized equipment, instrumentation, test and facilities required to support RDT&E contractor and/or Government installation.

Flyaway (Rollaway, Sailaway, etc.) Cost - Flyaway is used as a generic term related to the creation of a usable end item of hardware/software. Flyaway cost includes:

(1) WBS elements of Major System Equipment (such as basic structure, propulsion, electronics, including Government Furnished Equipment, etc.). System/Project Management, and System Test and Evaluation (if any of this effort is funded by Procurement).

(2) Procurement funded costs (i.e., Line Item Procurement Program); and

(3) All costs, both contract and in-house, of the Production Nonrecurring and Recurring cost categories, including allowances for engineering changes, warranties, and first destination transportation, unless the latter is a separate budget line item.

Weapon System Cost - Weapon System Cost includes:

(1) The same WBS elements as in Flyaway Cost (i.e., Major System Equipment, System/Project Management, System Test and Evaluation (if any of this effort is funded by Procurement)), plus WBS elements Training, Peculiar Support Equipment, Data, Operational/Site Activation and Industrial Facilities (unless funded as a separate budget line item or by RDT&E).

(2) Procurement funded costs; and

(3) All costs, both contract and in-house, of the Production Nonrecurring and Recurring cost categories, including allowances for engineering changes, warranties, and first destination transportation, unless the latter is a separate budget line item.

Procurement Cost - Procurement cost includes:

(1) The same WBS elements as in Weapon System Cost (i.e., Major System Equipment, System/Project Management, System Test and Evaluation (if any of this effort is funded by Procurement)), Training, Peculiar Support Equipment, Data, Operational/Site Activation, and Industrial Facilities (unless funded as a separate budget line item or by RDT&E), plus the WBS element: Initial Spares and Initial Repair Parts;

(2) Procurement funded costs; and

(3) All costs, both contract and in-house, of the Production Nonrecurring and Recurring cost categories, including allowances for engineering changes, warranties, and first destination transportation, unless the latter is a separate budget line item. For Navy shipbuilding programs, outfitting and post delivery costs are also included when Procurement funded.

Program Acquisition Cost - consists of Development Costs, Procurement Costs, and any construction costs which are in direct support of the system or project. Program Cost and Program Acquisition Cost are synonymous terms. Program Acquisition Cost includes:

(1) The WBS elements of Major System Equipment, System/Project Management, System Test and Evaluation (except Operational Test and Evaluation funded from Military Personnel or Operation and Maintenance), Training, Peculiar Support Equipment, Data, Operational/ Site Activation, Industrial Facilities (unless funded by Procurement as a separate budget line item), and Initial Spares and Initial Repair Parts;

(2) RDT&E, Procurement and MILCON funded costs; and

(3) All costs, both contract and in-house, of the Research and Development and Production (Nonrecurring and Recurring) cost categories, including allowances for engineering changes, warranties, and first destination transportation, except when the latter is a separate budget line item.

Ownership Cost - Ownership cost encompasses the cost elements within the Operations and Support (O&S) cost category exclusively. O&S costs include those costs associated with operating, modifying, maintaining, supplying, and supporting a weapon/support system in the DoD inventory.

(1) Included are costs for skill training, personnel movement, replenishment spares and repair parts.

(2) Operations and Maintenance (O&M), Military Personnel, Procurement, Military Construction, other appropriations and funds (stock fund) are used to operate and support DoD weapon/support systems.

Life Cycle Cost - Life Cycle Cost includes all WBS elements; all related appropriations; and encompasses the costs, both contract and in-house, for all cost categories. It is the total cost to the Government for a system over its full life, and includes the cost of development, procurement, operating, support, and, where applicable, disposal.

Figure 7-2 shows the relationship among the above cost categories.

5.0 FINANCIAL MANAGEMENT INFORMATION SYSTEMS

With the widespread use of microcomputers in the program office, there has been a dramatic rise in the number and quality of program office Financial Management Information Systems (FMIS).

These systems have been designed to take advantage of the power of new microcomputers and commercial software products. One specific system was designed and developed by a joint project office of the World Wide Military Command Control System (WWMCCS) Information System (WIS) Program. The system, called RMIS, for Resource Management Information System, was designed around a commercial data base to be run on a popular microcomputer configuration.

RMIS consists of three modules: I - approved funding by service/agency, fund type, purpose, and fiscal year; II - estimated costs in terms of particular site configuration over the life cycle of the program; and III - financial planning and execution - this module integrates the available funds from Module I and the requirements from Module II and tracks the committed, obligated, and expended funds along with the approved funding level.

RMIS is an example of a powerful system which can be of great help to a joint program office. A further description of RMIS may be found in the September 1985 issue of the "Journal of Parametrics."[8/]

6.0 SUMMARY

This chapter has discussed the role of the financial manager in the joint program office, cost estimating methodologies, a discussion of cost definitions, and an example of an automated financial information system. Major chapter points include:

- the breadth of the financial manager's activities,
- a discussion of the four estimating techniques,
- definitions of the seven uniform cost definitions,and
- a discussion of an automated FMIS.

REFERENCES AND FOOTNOTES:

1/ DoDD 5000.4, "Baselining of Selected Major Systems," August 1986.

2/ "Program Manager's Notebook, Defense Systems Management College, 1985, p.5.2.

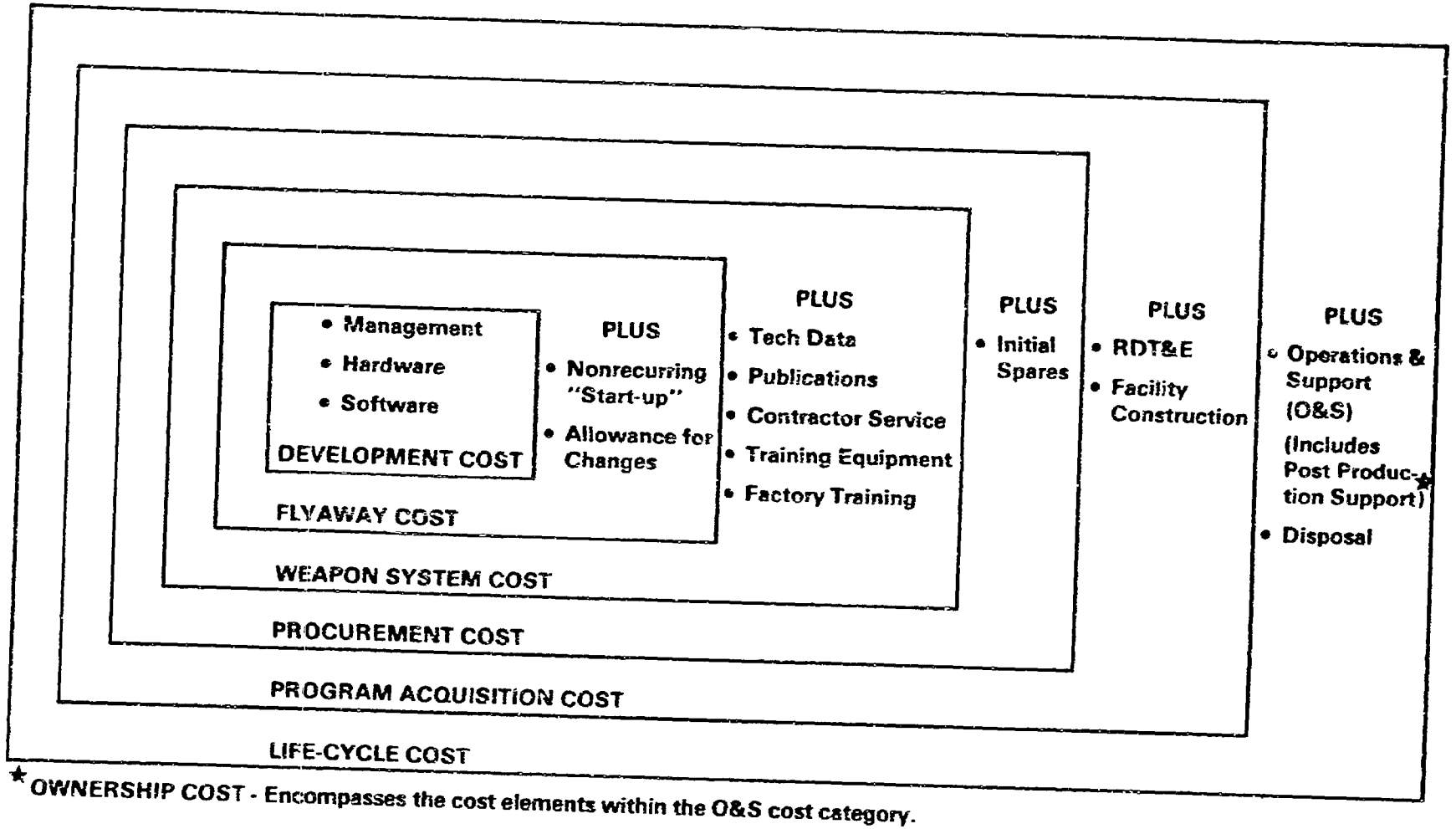
3/ "Program Manager's Notebook, Defense Systems Management College, 1985, p.11.1a.

4/ "Program Manager's Notebook, Defense Systems Management College, 1985, p.5.7c.

5/ Boehm, Barry W., Software Engineering Economics, Prentice-Hall, Inc. 1981.

6/ DoDI 5000.33, "Uniform Budget/Cost Terms and Definitions," August 1977.

7/ DoD 7710.1-M, "Department of Defense Budget Guidance Manual," July 1982.



★OWNERSHIP COST - Encompasses the cost elements within the O&S cost category.

Figure 7-2 Cost Relationships

8/ "Journal of Parametrics," Vol. 5, No. 3, September 1985, pp. 52-63.

CHAPTER 8

ENGINEERING, PRODUCTION, AND SOFTWARE MANAGEMENT

1.0 SYNOPSIS

The three areas of management, engineering, production, and software, are vital to the success of any major acquisition program. Success, as in any management effort, is effective planning, execution and follow through which transforms a military requirement into an operational system. Engineering management includes the system engineering process of a logical sequence of events and decisions tranforming an operational need into a description of system performance parameters and a preferred system configuration including all hardware and embedded software requirements. Production management objectives are to accomplish production planning during the development phase of the acquisition, evaluate production criteria prior to the decision to produce, and subsequently monitor the production effort to ensure that it is efficient and effective. Software management continues to become more and more critical to the success of a program as military weapon systems become more sophisticated and automated. Significantly, more effort and costs are involved in the design, development and testing of software than the system within which it operates. Certain aspects of joint service acquisitions can benefit the management of such systems, while other aspects dictate the need for more managerial attention. Accordingly, the following sections of this chapter discuss various aspects of the three management areas. Section 2.0 discusses engineering management. Production management is presented in section 3.0 and software management is discussed in section 4.0. Finally, a summary of the chapter is provided in section 5.0.

2.0 ENGINEERING MANAGEMENT

More information is available on the subject of engineering management than on any other aspect of joint service acquisitions. Guidance and procedures range from the Federal Acquisition Regulation (FAR) to DoD and service directives, instructions, regulations, orders, manuals and pamphlets, including military standards, such as MILSTD-499A which discusses criteria for evaluating engineering planning and output.[1/] DSMC's Systems Engineering Management Guide is an integrated summary of technical management methods specifically designed as a PMO reference.[2/] Additionally, there is a multitude of professional reference manuals, books and journals. Certain factors in engineering management can benefit a joint program: the operational requirement, which should be well developed as a result of the participating services interaction; the acquisition strategy, which also provides direction to engineering management, as in the case of Preplanned Product Improvement (P^3I) should be integrated into the engineering planning, thus enhancing the management effort. Likewise, the establishment of common standards in engineering disciplines will facilitate representatives of participating services to comprehend the core requirements for specific functions. For example, reliability programs in all services are based on MILSTD-785B and maintainability programs should comply with MILSTD-470A.[3/4/]

Further, DoD Directives such as DoDD 4120.11, 5000.40, and 5000.43 provide guidance for the tailoring of standards, specifications and related documents.[5/6/7/] These directives require the modification of referenced system documentation to meet the development

and management needs of the acquisition. An example of the tailoring of standards and specifications is the Air Force's MIL-PRIME Program. The philosophy of the program is to: prepare documents that represent the best starting point for tailoring documents for a specific program; state only performance requirements, *i.e.*, defining performance parameters and leaving specific values blank; reduce the referenced specifications; and retain "lessons learned" in a non-contractual appendix to assist in tailoring. As of May 1987, ASD has released fifty-four (54) tailored MIL-SPECs and MIL-STDs. The potential for both management and cost effectiveness can be illustrated by the reduction of the number of specifications required for a landing gear. Before MIL-PRIME, it required thirteen (13) specifications that referenced 256 technical documents. After the implementation of MIL-PRIME, it only necessitated the use of one specification that referenced two technical documents. The Army and the Navy are also streamlining a number of their standards and specifications for designated programs. Along with the number of benefits that can be cited for tailoring, a primary caution must be made concerning a potential for oversimplification that could result in inadequate contract specifications and the development of a system that does not meet its operational requirements objectives.

DoDD 5000.43 of 15 January 1986, pertaining to acquisition streamlining, should be specifically noted since it emphasizes the need for action that results in more efficient and effective use of resources to develop, produce, and deploy quality defense systems and products. This includes ensuring that only cost-effective requirements are included, at the most appropriate time, in system and equipment solicitations and contracts. Also as part of the streamlining effort, the directive recommends tailoring the data requirements by determining the essentiality of potential Contract Data Requirements List (CDRL) items. In this regard, for example, SECNAVINST 4210.6[9] specifies that prior to a program entering Full Scale Engineering Development (FSED) the Specification Control Advocate General (SPECAG) must certify that the development specifications including the CDRL, have been reviewed and tailored to the operational requirements. In addition to tailoring, an alternative approach to improving the cost effectiveness in the utilization of military specifications and standards has been proposed that is referred to as "partitioning" which may also be considered for application by the joint program manager. (See reference 9.)

In the acquisition process, sometimes the first evidence of weapon system problems does not become apparent until a program transitions from Full-Scale Development (FSD) into Production. This critical risk area has been studied and it has been determined that the risks are the result of technical aspects of the acquisition rather than managerial. In an effort to reduce the risks of program transitions as much as possible, DoD has promulgated DoDD 4245.7 which mandates the use of its associated manual, DoD 4245.7-M.[10/11] The manual, Transition from Development to Production, provides Program Managers with assistance in structuring technically sound programs, assessing their risk, and identifying areas needing corrective action through the use and application of Templates. The Templates describe techniques for improving the acquisition process by recognizing it for what it is - an industrial process concerned with the design, test, and production of low risk products.

Configuration Control. One facet of engineering management that will require increasing attention by the joint

program manager is the need to control engineering changes. Of the many factors which contribute to the pressure for engineering changes in system design, three are significant and interrelated:

- First, validated changes to system requirements by the sponsoring organizations inevitably lead to changes in the system design. The joint program manager should be especially alert to these and must require that sponsors recognize that incrementally changed requirements can bring about a virtually new program.

- Second, pressure for change comes from the technology community - government and contractor laboratories - who find a better way to accomplish the original requirement after acceptance of a preliminary design. Developmental tests will, of course, bring to light those system specifics which require change to allow the system to work.

- The third source of pressure to change a design is not really separate from the first two at all. It is the seemingly geometric rate of technological advancement in today's world which would require a system to be conceived, designed, tested, produced, and fielded in a year to prevent its obsolescence before deployment. It is this last pressure which will cause a program never to reach fruition if the program manager cannot resist incorporating every "improving" change.

The joint program manager may get more pressure for changes in system design than will a single-service program manager because of requirements changes from the participating services. Well-defined requirements and the problems stemming from failure to achieve them prior to engineering development are addressed in Chapter 3. Changing requirements cannot be handled by configuration control board procedures, but the sponsors' knowledge of the program manager's resistance to unnecessary change may prevent incremental requirements upgrading from gathering momentum. In this regard, the program manager should ensure that the PM's staff has effectively baselined the system to be acquired in accordance with DoD Directive 5000.45, "Baselining of Selected Major Systems," 25 August 1986 and related Service directives.

It is axiomatic in the field of program management that risk and commitment have an inverse relationship throughout the acquisition process. The program manager may consider tying the parameter "resistance to change" to that of commitment in the program management plan so that at each succeeding development milestone, as risk is expected to decrease, resistance to change, as well as commitment, is expected to increase. The recognition of such a management policy by sponsors, developers, and contractors will preclude their interpretation of the joint program manager's early seeking of innovation as continuing acceptance of change.

Primary guidance regarding risk management is provided in the following references:

- DoD Directive 4245.7, "Transition from Development to Production," 19 January 1984;

- DoD Manual 4245.7, "Transition from Development to Production," September 1985; and

- "Risk Assessment Techniques," DSMC, July 1983.

3.0 PRODUCTION MANAGEMENT

Production management is defined as the effective use of resources to produce, on schedule, the required number of end units that meet specified quality,

performance. and cost. The field of production management encompasses industrial resource analysis, producibility assessment, producibility engineering and planning, production engineering, industrial preparedness planning, post-production planning, and productivity enhancement. Its goals are to:

- accomplish production planning during the development phase of the acquisition,
- document and review pertinent production criteria before the decision to produce is made, and
- monitor the production program once it is implemented.

DoD Directive 4245.6 provides the overall policy, procedures, and responsibilities for production management in the Department of Defense during the acquisition of defense systems and equipment.[12] Production management efforts should incorporate the following coupled with the application of the Templates mandated by DoD Manual 4245.7-M:

- Emphasis should be placed on the application of fundamental engineering principles and relevant technical disciplines during development and production. Assessment of production risks should be made throughout the acquisition process and should be formalized through Industrial Resource Analyses (IRAs) and Production Readiness Reviews (PRRs). Likewise, risks should be reduced to acceptable levels in accordance with DoD Directive 4245.7 and DoD Manual 4245.7-M.
- A manufacturing strategy should be developed as part of the program acquisition strategy. Manufacturing voids, deficiencies, and dependencies on critical foreign source materials should be addressed concurrently with concept demonstration and validation through the use of manufacturing technology projects in accordance with DoD Instruction 4200.15[13], or other means. The producibility of each system design concept should be evaluated at the Full-Scale Development (FSD) decision point to determine if the proposed system can be manufactured in compliance with the production cost and industrial base goals and thresholds.
- Contractor past performance (to the extent that it has a bearing on the concept involved), production management capability, quality history, and the potential to execute the production program should be among those factors included in the contractual solicitations and evaluated thereafter in the source selections.
- A comprehensive Producibility Engineering and Planning (PEP) program is a requisite for entering FSD. PEP programs should be conducted throughout FSD and should contain specific tasks, measurable goals, and a system of contractor accountability to ensure a timely and economic transition from the development to the production phase of the program.
- A quality program in accordance with DoD Directive 4155.1[14] should be conducted throughout acquisition and deployment. Industrial preparedness planning should be integrated effectively with production management and production planning under DoD Directive 4005.1.[15] Determinations of priorities and allocations should be within the framework of the lead service's delegation of authority, consistent with DoD Instruction 4400.1.[16] Bills of Materials should be purchased and maintained by the lead service for the determination and accountability of controlled, strategic and critical material requirements. Accordingly, material reporting to DoD

on joint services programs will be accomplished by the lead service.

- Production decisions under consideration at the Defense Acquisition Board (DAB) review or other OSD program review should include an evaluation of the findings of a formal Production Readiness Review (PRR) that was planned and conducted in accordance with DoD Instruction 5000.38.[17] The PRR should confirm:

  - The stability and producibility of the design.

  - Progress toward meeting reliability and maintainability characteristics,

  - The adequacy of supporting manufacturing technology.

  - The refinement of manufacturing methods, techniques, and processes.

  - The suitability of manufacturing, cost, and quality assurance control provisions.

- An acquisition should not proceed into production until it is determined that the principal contractors have the physical, financial, and managerial capability to meet the cost and schedule commitments of the proposed procurement. An assessment should be made of the contractors' capabilities to meet surge (peacetime) and mobilization (declared national emergency) requirements and their commitments to participate in the DoD industrial preparedness production planning program under DoD Directive 4005.1.[15]

- Competition, value engineering, tailoring of specifications and standards, design-to-cost, cost benefit and trade-off assessments, preplanned product improvements, multiyear procurement, industrial modernization incentives, and other techniques should be used, as appropriate, to reduce production, operating, and support costs. Standardization, commonality, and interchangeability should be promoted throughout the acquisition cycle to reduce lead time and life-cycle cost.

- Technical data packages should be developed and proven by means of production demonstration and configuration audit, consistent with competition, component breakout, and reprocurement objectives.

- Continued emphasis should be placed on life-cycle cost reduction during the production phase through the use of contractual incentives and other means.

- Production management planning and implementation should include provisions for measuring progress in meeting design-to-cost and life-cycle cost commitments.

- Selection of contracts and subcontracts requiring contractor cost and schedule management systems to comply with the DoD Cost/Schedule Control Systems criteria shall be made in accordance with DoD Instruction 7000.2.[18] When a contractor or subcontractor is not required to comply with the criteria, the Cost Schedule Status Report approach to performance measurement set forth in DoD Instruction 7000.10[19] normally should be used.

- Production engineering and management should include those actions that are required to maintain a capability to produce material for the operation and maintenance of equipment after the production phase is complete. The planning for these post-production activities should start during the development phase.

Finally, production management should be addressed specifically at each

program milestone decision point in the major system acquisition process in accordance with DoD Instruction 5000.2.[20/]

- Milestone I - Demonstration and Validation. Production feasibility of candidate system concepts should be addressed and areas of production risk defined. Manufacturing technology needed to reduce production risk to acceptable levels should be identified. Preliminary goals and thresholds for production cost should be formulated. Preliminary goals and thresholds for industrial base capability should be developed based on an Industrial Resource Analysis (IRA).

- Milestone II - Full-Scale Development (FSD). The producibility of the design approach should be confirmed and production risk determined acceptable. The FSD phase shall include provisions to attain producibility of the production design using cost-effective manufacturing methods and processes. Resource requirements for PEP, long-lead procurements, critical materials, labor skills, facilities, equipment, and limited production should be identified and programmed, and the capability to meet production unit cost, schedule and surge requirements should be confirmed at the prime and key subcontract levels.

- Milestone III - Production and Deployment. Production decisions should be supported by an assessment of the program readiness for production, based on a formal Production Readiness Review (PRR). The PRR should include assessing the results of Producibility Engineering and Planning (PEP) effort and manufacturing technology activities, and plans and provisions for accomplishing cost reduction during production should be described.

There are a considerable number of relevant guides, handbooks, pamphlets, and reports that are oriented towards the engineering and manufacturing field of military acquisition management. Examples include:

- "System Engineering Management Guide," DSMC, December 1986.

- "Manufacturing Management Handbook for Program Managers," 2nd Edition, DSMC, July 1984.

- "Report of Defense Science Board Task Force on Transition of Weapons Systems from Development to Production," Office of the Under Secretary of Defense, August 1983. ADA 135-049.

- JLC's joint regulation, "Joint Design-to-Cost Guide," DARCOM P700-6, AFLCP/AFSCP 800-19, 15 October 1977.

- GAO Report, "Assessing Production Capabilities and Constraints in the Defense Industrial Base," Report PEMD-85-3, 4 April 1985.

4.0 SOFTWARE MANAGEMENT

Control of the development of software and its documentation is a requirement which has become more significant and demanding with the increasing degree of incorporation of computer technology into military systems. The voluminous and esoteric nature of computer software makes its management extremely demanding. The joint program manager is tasked to determine and direct the steps necessary to keep the software development from becoming an impediment to program completion. Additionally, the PM must ensure that the potential for interservicing of software and transportability are reviewed and that all software support options are fully analyzed. Of all the tasks performed by the PM, one of the most important entails working closely with using and developing activities to ensure that the re-

sulting software fulfills its designated requirements.

DoD Directive 5000.29 establishes the policy for the management and control of computer resources during the development, acquisition, deployment and support of major defense systems.[21] Although the directive was published over a decade ago,it is still effective and has been augmented by two DoD standards, DoD-STD-2167A on defense system software development[22] and DoD-STD-2168 on the defense system software quality program.[23] In addition, DoD Directive 3405.2 directs the use of Ada as the single, common, high-order programming language in computers integral to weapon systems.[24]

Software development is usually an iterative process, in which an iteration of a software development may occur more than once during each of the acquisition phases. Figure 8-1 presents a typical software acquisition as it relates to the hardware acquisition. The software development cycle usually includes the following six phases:

- Software Requirements Analysis
- Preliminary Design
- Detailed Design
- Coding and Unit Testing
- Computer Software Component (CSC) Integration and Testing
- CSCI Testing

Each iteration of the software development cycle, regardless of the acquisition phase in which it occurs, should be initiated by the allocation of system requirements to the software or a subsequent revision to those requirements. The relationship of the software development cycle phases with the products, reviews and audits, baselines and Developmental Configuration are presented in Figure 8-2. The figure reflects the sequential phases of a software development cycle, as well as the documentation which typically exists prior to initiating an interation. Figure 8-1 cites the various reviews, including design reviews. The purposes of the reviews are discused in MIL-STD-1521B, Technical Reviews and Audits for Systems, Equipments, and Computer Programs.

The joint program manager should understand that not only is software development an iterative process, several iterative development efforts of various software components may be in process at the same time. Each iteration may also represent different version of the software. Also within each iteration, the software development phases typically overlap, rather than form, a discrete initiation to completion sequence.

5.0 SUMMARY

- Certain factors in engineering management can benefit a joint program such as a well developed operational requirement as a result of participating services interaction, use P^3I in engineering planning, the establishment of common standards that facilitate participating services to comprehend the core requirements for specific functions.

- DoD Directives 4120.11, 5000.40 and 5000.43 provide guidance for tailoring standards, specifications and related documentations.

- Acquisition streamlining as contained in DoD Directive 5000.43 emphasizes the need for action that results in more efficient and effective use of resources to develop, produce and deploy quality defense systems and products. This includes ensuring that only cost-effective requirements are included, at the most appropriate time, in system

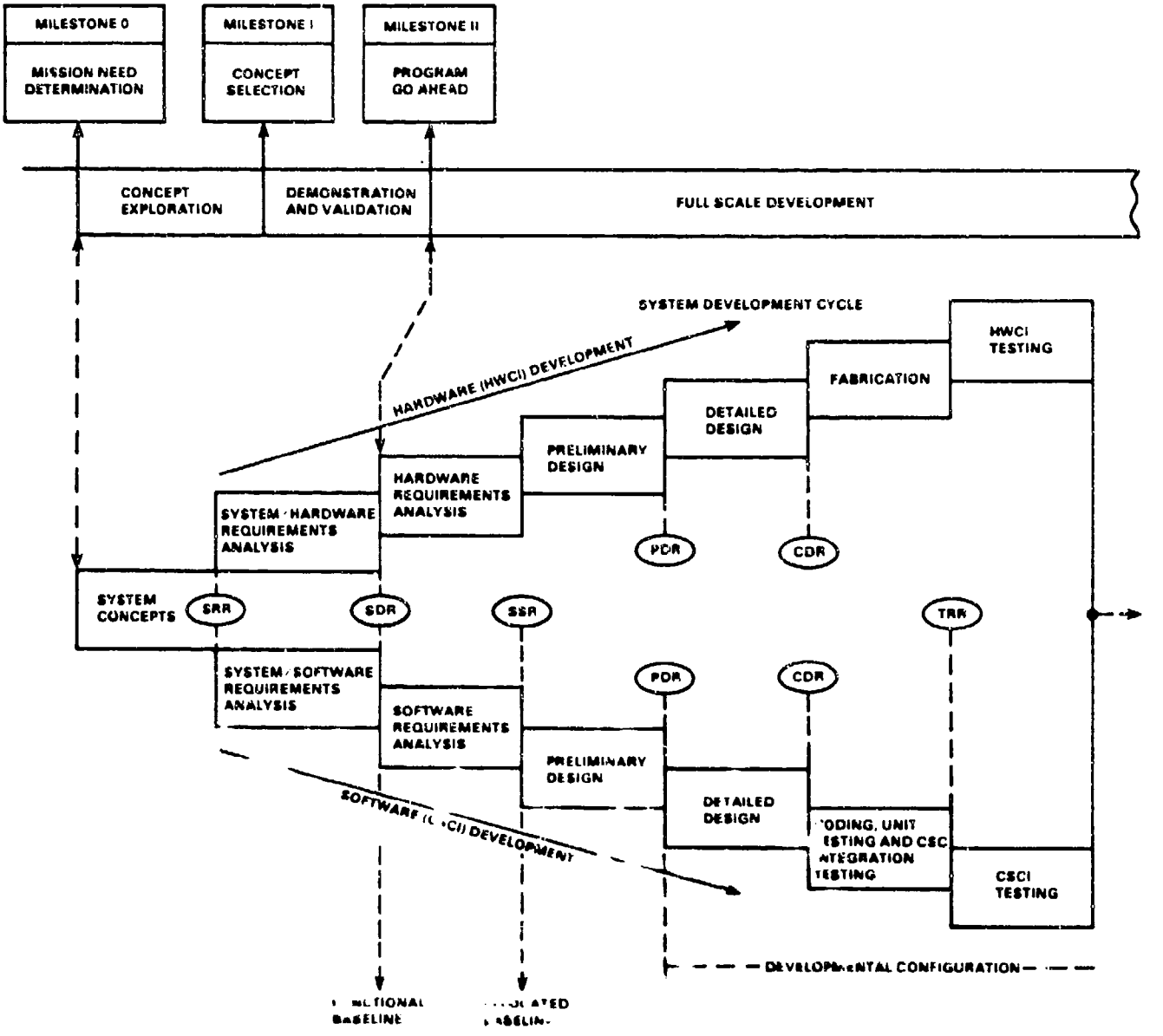


Figure 8-1 Software and Hardware Acquisition Phases [21]

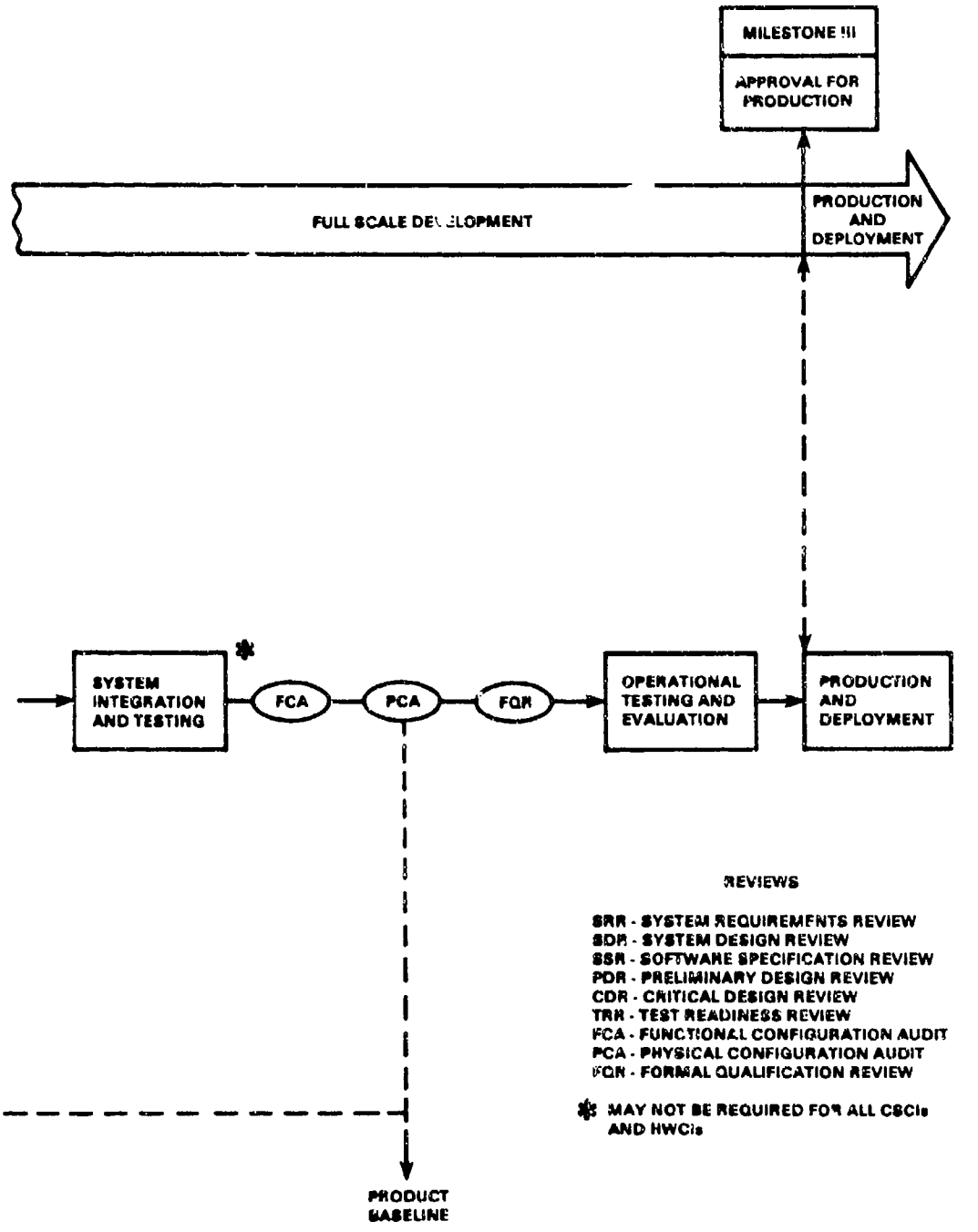
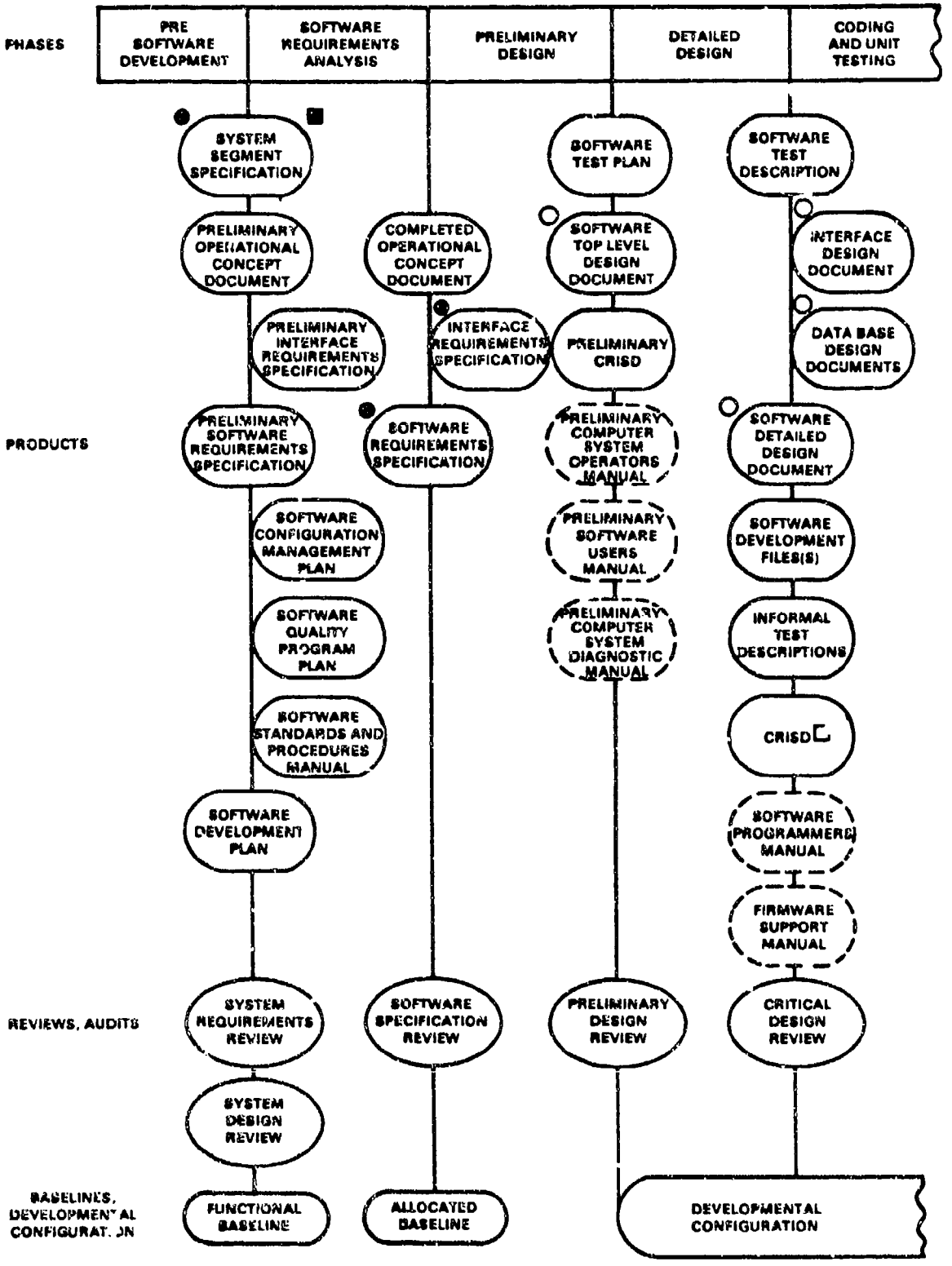


Figure 8-1 Software and Hardware Acquisition Phases [21] (Continued)



NOTE: Legend is provided on continuation page of Figure 8-2

Figure 8-2 Software Development Cycle [21]

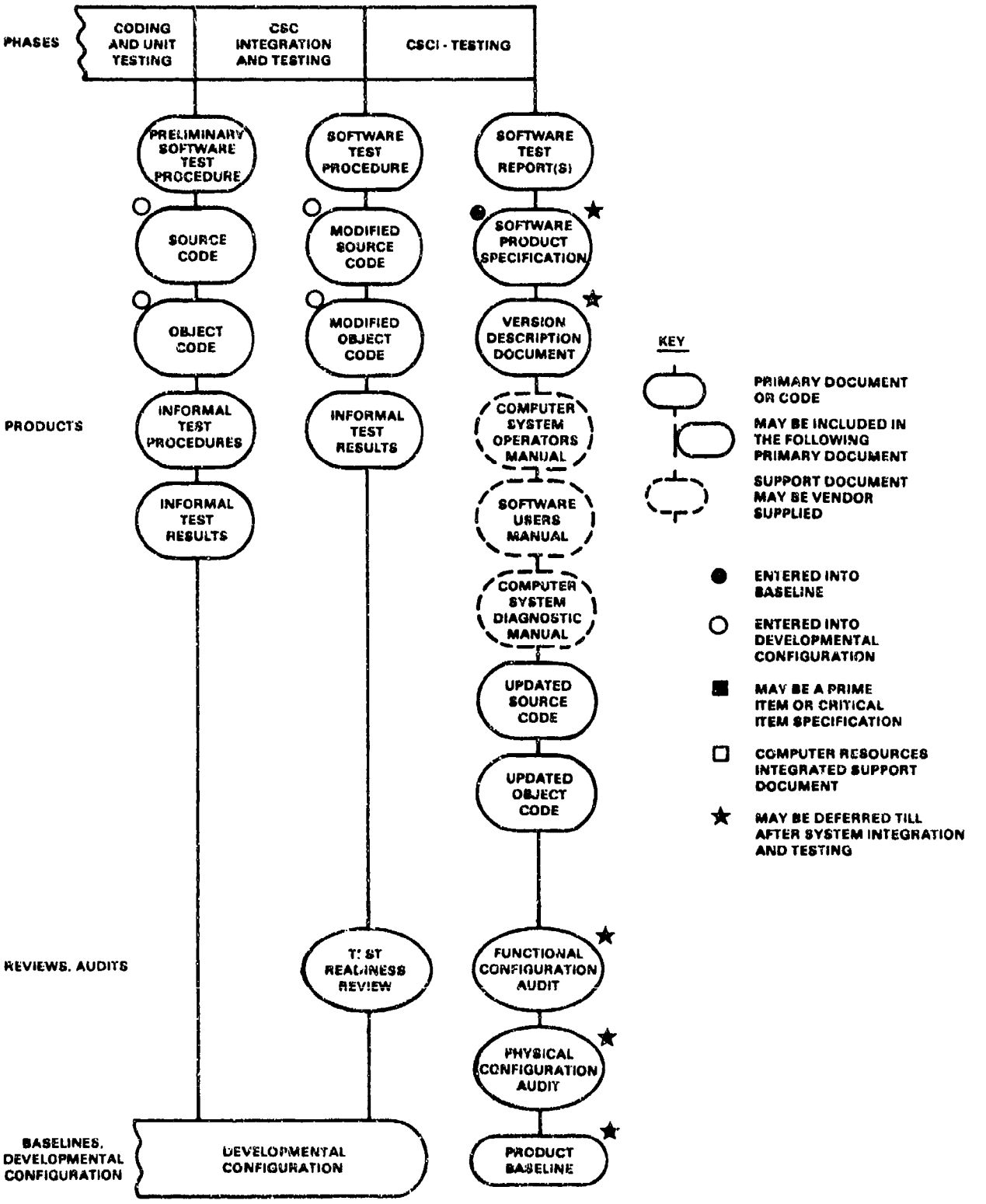


Figure 8-2 Software Development Cycle [21]
(Continued)

and equipment solicitations and contracts.

- Configuration control requires the increased attention of the joint program manager especially to stabilize the system requirements and design to the maximum extent possible, and to effectively control all changes.

- Production management is the effective use of resources to produce, or schedule, the required number of end units that meet specified quality, performance, and cost.

- The goals of production management are to: accomplish production planning during the development phase of the acquisition, document and review pertinent production criteria before the decision to produce is made, and then monitor the production program once it is implemented.

- DoD Directive 5000.29 establishes the policy for the management and control of computer resources during the development, acquisition, deployment and support of major defense systems. In addition, two DoD Standards, 2167A and 2168, complement the directive by providing detailed procedures for the development for quality software.

REFERENCES AND FOOTNOTES:

1/ MILSTD-499A, "Engineering Management," 1 May 1974.

2/ "Systems Engineering Management Guide," DSMC, December 1986.

3/ MILSTD-785B, "Reliability Program for Systems, and Equipment Development and Production," 15 Sept. 1980.

4/ MILSTD-470A, "Maintainability Program Requirements (For Systems and Equipments)," 3 Jan. 1983.

5/ DoDD 4120.11, "Standardization of Mobile Electric Power Generating Sources," 19 Nov. 1979.

6/ DoDD 5000.40, "Reliability and Maintenance," 8 July 1980.

7/ DoDD 5000.43, "Acquisition Streamlining," 15 January 1986.

8/ SECNAVINST 4210.6, "Acquisition Policy."

9/ Pratt, Robert J., Major, USAF, "Partitioning of Military Specifications and Standards," Study Project Report PMC 77-2, DSMC, November 1977. ADA 050-529.

10/ DoDD 4245.7, "Transition from Development to Production," 19 January 1984.

11/ DoD Manual 4245.7-M, "Transition from Development to Production," September 1985.

12/ DoDD 4245.6, "Defense Production Management," 19 January 1984.

13/ DoDI 4200.15, "Manufacturing Technology Program," 24 May 1985.

14/ DoDD 4155.1, "Quality Program," 10 August 1978.

15/ DoDD 4005.1, "Industrial Preparedness Program," 26 November 1985.

16/ DoDI 4400.1, "Priorities and Allocations - Delegation of DO and DX Priorities and Allocations Authorities, Rescheduling of Deliveries and Continuance of Related Manuals," 16 November 1971.

17/ DoDI 5000.38, "Production Readiness Reviews," 24 January 1979.

18/ DoDI 7000.2, "Performance Measurement for Selected Acquisitions," 10 June 1977.

19/ DoDI 7000.10, "Contract Cost Performance, Funds Statu and Cost/Schedule Status Reports," 3 December 1979.

20/ DoDI 5000.2, "Major System Acquisition Procedures," 12 March 1986.

21/ DoDD 5000.29, "Management of Computer Resources in Major Defense Systems," 26 April 1976.

22/ DoD-STD-2167A, "Defense System Software Development," 15 August 1986.

23/ DoD-STD-2168, "Defense System Software Quality Program," 1 August 1986.

24/ DoDD 3405.2, "Use of Ada in Weapon Systems," 30 March 1987.

CHAPTER 9
LOGISTICS

1.0 SYNOPSIS

As with each acquisition discipline, joint programs will encounter many challenges in the field of logistics due to the variety of logistic management concepts of the various services. Achievement of logistic supportability must be accomplished and necessitates that all support requirements be considered, planned and budgeted from the beginning of the acquisition process. Logistics management objectives of joint programs are: economic joint performance of Integrated Logistics Support (ILS) planning, analysis and documentation; to satisfy essential needs of each of the participating services; and to attain established readiness and supportability objectives.[1] This chapter discusses primary logistics planning aspects that are of major concern to the joint program manager and the joint ILS manager, as well as the participating services. Section 2.0 discusses the multiservice acquisition ILS program. Section 3.0 discusses Integrated Logistics Support (ILS) planning. Next, several logistics support planning and management tools are presented in section 4.0. Then, a summary of the chapter is provided in section 5.0.

2.0 MULTISERVICE ACQUISITION ILS PROGRAM

The concepts and principles of Integrated Logistic Support (ILS), as contained in DoD Directive 5000.39[2] and Joint directive developed under the auspices of the Joint Logistic Commanders - AR700-129/OPNAVINST 4105.2/AFR 800-43/MCO 11310.86[3] should be used in all multiservice acquisition programs. The ILS regulations of the involved services will be complied with to the maximum extent possible. Where impasses occur between service unique ILS policy and procedures, the order of precedence will be DoD Directive 5000.39, next the Joint ILS directive cited above, and then the lead or executive service ILS regulation. The lead service should make every effort to accommodate the unique requirements of the participating services. All involved services should standardize ILS requirements and data products to the maximum extent possible.

The overall objective of an ILS program is to field supportable systems/equipment in the planned operational environments that meet established system/equipment requirements or System Readiness Requirements at an affordable Life-Cycle Cost (LCC).

The lead service should designate an ILS manager, prior to establishing an acquisition strategy, to execute the ILS program, and provide support to the joint program manager in all matters related to the ILS program. The ILS manager should:

- Ensure that the participating Services designate an ILS focal point to serve on and support the ILS program.
- Prepare an ILS program Joint Memorandum of Agreement (JMOA) in conjunction with participating Services.
- Coordinate with and include participating Services in all major ILS program decisions, actions, and planning efforts.
- Ensure that procedures for determining sources of funding for participating Service-unique ILS requirements are included in the JMOA.
- Ensure planning, solicitation, and contractual documents include ILS program requirements. In conjunction with

participating Services, identify work unique service requirements, maintenance and support concepts, and data requirements for contractual application.

- Identify, control and document an executive Service maintenance and support concept. Ensure the participating Services maintenance, and support concept, and deployment, transfer or fielding requirements are identified, documented, and provided to the lead Service ILS program organization, for incorporation into the Joint ILS Plan (JILSP) and JMOA. Ensure the planning process accommodates commonalities and legitimate differences between Service concepts.

The participating services should designate an ILS representative to support the lead service ILS manager. If possible, co-locate participating Service ILS managers with the lead Service ILS program office when warranted by program complexity and impact. Further, the participating Service ILS manager should:

- Participate in preparation of requirements identification evaluation and update of the JILSP, ILS program JMOA, and program planning, solicitation, and contractual documents.

- Identify, document and provide Service unique ILS programs requirements and maintenance concept, deployment requirements, and support concepts to the lead Service ILS manager. Ensure legitimate Service differences in support requirements are identified and accommodated during the support planning process.

- Define procedures for determining source of funding for participating Service unique requirements as included in ILS program JMOA.

- Provide members on the ILS Management Team (ILSMT) and representation at all joint meetings such as ILSMT meetings, in-process reviews, provisioning conferences, Logistic Support Analysis (LSA) reviews, technical documents verification and reviews, and design reviews.

The participating services are responsible for ensuring full participation in the joint ILS program management and execution. Primary aspects of the joint ILS effort are cited below:

LSA Program. The ILS Management Team (ILSMT) should ensure that the application of MILSTD-1388-1A[4/] and MILSTD-1388-2A[5/], regarding Logistic Support Analysis (LSA) are tailored based on the complexity and ILS program requirements.

Joint ILS Plan (JILSP). The JILSP should be initiated when the lead Service ILS Manager is designated. The plan should be prepared by the lead Service in conjunction with the participating Services, and expanded as required by the lead service. Each Service unique ILS program planning information and requirements should be contained in a separate JILSP annex.

ILS Program Joint Memorandum of Agreement (JMOA). An ILS program JMOA should be prepared to formalize the responsibility and procedures for joint ILS program operation and should include procedures for resolving impasses between the Services involved. The ILS Manager for each involved Service should sign the ILS program JMOA. The ILS program JMOA will be completed and coordinated within 150 days of the initiation of a multiservice acquisition. JMOA revisions may be renegotiated at any time during the system/equipment acquisition process. The ILS program JMOA will be attached as an annex to the JILSP.

ILS Elements. A single set of ILS elements should be identified and agreed to during formulation of the ILS program JMOA. This single set should include all the ILS elements contained in DoDD 5000.39 and other selected ILS elements contained in the lead and participating Services ILS regulations. The JILSP will cover all selected ILS elements.

Ancillary Equipment. Logistic support for ancillary equipment should be planned as an integral part of the multiservice system/equipment acquisition effort.

Intermediate Support. Joint use of centralized intermediate maintenance facilities should be encouraged to reduce duplication.

Depot Support. Responsibility for depot repair and maintenance should be as determined by the Depot Maintenance Interservice (DMI) study (as performed by a Joint Depot Maintenance Analysis Group (JDMAG)), based on data provided the lead Service.

ILS Management Team (ILSMT), ILS Program Organization. An ILSMT should be established as the ILS program organization, and meet as required to assist and support the lead Service ILS manager in accomplishing program related ILS functions. The ILSMT should be composed of members from both lead and participating Services and chaired by the lead Service ILS amanger. An LSA review team composed of government ILS and logistic element representatives, headed by the lead Service ILS manager, should be established as part of the ILSMT.

Unique Service Requirements and Deployment Requirements or Plans. Deployment requirements/plans, system/equipment Material Fielding Plans, System Turnover Plan (transition plan), installation plans, and other such Service plans should be prepared by each involved Service. If no single format is acceptable, Service unique formats should be used. When Service unique formats are used, a copy should be provided to the lead service ILS manager.

ILS Lessons Learned. Applicable ILS lessons learned should be selected by the requiring activity, and applied both to internal ILS program management, execution and contractual ILS requirements. Feedback should be provided to both lead and participating Services ILS lessons learned data bases.

Maintenance Planning. Specific maintenance concepts for each Service should be documented in the JILSP, by Milestone I, and any changes should be approved by the ILSMT. Maintenance concepts and planning should be updated prior to each decision point.

ILS Points of Contact. To facilitate multiservice ILS program management and execution, a listing of Service ILS points of contact should be maintained and updated as required.

Training. Joint use of centralized training facilities for operator and maintenance training should be encouraged to reduce duplication.

Test and Evaluation. Test and evaluation criteria will evaluate supportability and ensure representation from each participating service and the contractor to review supportability issues/evaluations. Test and evaluation criteria (or plans) should: (1) Ensure participating Services are involved in developing supportability test issues and test plans for both hardware and software; and (2) The detailed maintenance planning in the JILSP should be used as the basis for the initial Operational Test and Evaluation (OT&E) and all follow-on OT&E.

3.0 INTEGRATED LOGISTICS SUPPORT (ILS) PLANNING

The Integrated Logistics Support (ILS) planning functions are essential to the successful integration of an equipment into operational use. The ILS concepts must be initiated in conjunction with the equipment design concept. The consideration of the ILS should not be postponed beyond the development phases because the interdependent ILS tasks will be little more than analysis of an existing design to determine what must be done to support it. Rather, the purpose of the ILS is to influence design for the sake of readiness and support. Delay causes support system choices to be limited, and design changes expensive to implement. Therefore, the most effective way of implementing ILS is to design it into the evolving equipment features initially. This requires integrated planning of design for performance and design for support concurrently. The ILS disciplines include the following:[2/]

- Maintenance Planning
- Manpower and Personnel
- Supply Support
- Support Equipment
- Technical Data
- Training and Training Support
- Computer Resources Support
- Facilities
- Packaging, Handling, Storage, and Transportation
- Design Interface

Reliability and Maintainability, while not specifically defined as logistics elements, are logistic-related design parameters which must be expressed early in the program in operational terms, and must be stated as design requirements that are specifically targeted to achieve readiness and supportability objectives.

Operating Concepts

The starting point for logistics planning is an understanding of how the equipment will be used: the mission, the operating environment, the tactical deployment, and the forces that will use and support it. It is essential that the operating concept be prepared for each alternative by Milestone I and finalized by Milestone II. The operating concept should be clearly understood by the joint program management team.

Logistics planning must begin at the initial program milestone, *i.e.*, program initiation. It is at this point that the mission element need statement, the Justification for Major System New Start (JMSNS) reflects the baseline equipment operation and logistic environment established. Each decision milestone requires updated logistics planning, programming, and certification. The participating services should assist in formulating an initial logistics planning document, such as the Joint Integrated Logistic Support Plan (JILSP). Appendix D describes the recommended content and format of a JILSP. Given identical equipments, each of the participating services may employ them differently, thereby generating different logistics requirements. Thus, their different operating concepts could influence the equipment and support system design significantly. The JILSP focuses management attention on the problems that different operating concepts may create in terms of equipment design and support system alternatives. The JILSP also acts as a cohesive agent, encouraging the services to establish and integrate their logistics plans early. The

Integrated Support Plan (ISP) prepared by the contractor should complement the JILSP and reflect the contractors approach to complying with the logistics requirements established for the joint program.

The operating commands of each participating service determine how a system is used. In the Army, the Training and Doctrine Command (TRADOC) normally represents the eventual user. In the Navy, the mission sponsor (*e.g.*, the Deputy Chief of Naval Operations for Air Warfare) usually prepares the plan for use and coordinates it with the Fleets. In the Air Force, the using command (*e.g.*, Tactical Air Command) participates directly in the acquisition program, influencing, among other things, how the new system will be employed.

Although strongly encouraged, if the user (or his representative in the acquisition process) does not advocate an operating and support concept the joint program manager must take the initiative. As the program progresses through the acquisition process and the equipment design and capabilities become better defined, firm operating and maintenance plans will evolve. If these concepts are not defined early, the logistics planning baseline will not be properly established, and program schedule and cost could be adversely affected. As a rule, the preponderant program costs of ownership are locked in as design is being frozen. Since this is well before O&M, costs actually begin, logistics R&D tasks offer major cost effectiveness opportunities.

Support Concepts

There are service differences in practically every aspect of support - the organizational structures, type of support available at each level, occupational skills, training, facilities, test equipment, and support environment. The differences, though not significant enough to preclude effective support of virtually any equipment by any service, may cause a serious impact to the preferred equipment design (especially maintenance characteristics), or the range of feasible support concepts, and the support resource requirements of each participating service. Some of the Logistic Support Analysis[3/] tasks, performed during R&D, provide the trade-off analyses needed to accommodate these differences.

The services recognize three levels of maintenance: organizational, intermediate and depot. The Marine Corps also has three levels of maintenance for aircraft, however, for ground equipment they employ four levels: organizational, direct support, general support, and depot.

It might appear that Army direct and general support are comparable to Navy and Air Force intermediate maintenance, but that is not the case. Many maintenance tasks done at the direct support level in the Army would be done at the organizational level in the Navy or Air Force. Many of the general support tasks would be done at the Navy or Air Force depot.

The intermediate level in the Navy is not always similar to that of the Air Force. Ships, for example, must be largely self-sufficient; tasks which would be intermediate level on an Air Force system might be considered organizational level on a ship system. Even for aircraft and aircraft systems, where the similarities among the services' maintenance structures are most apparent, there are major differences in the environments, facilities, test equipment, and maintenance skills available at each level. To begin to appreciate the differences, one need only imagine the maintenance operations on a pitching

rolling deck of a ship or a hastily prepared jungle base compared to those on an established air field.

There are frequently also differences among the services in the proximity of support organizations to operating forces. Because of those differences, a support concept which would provide one service with acceptable maintenance turn-around times may be unable to support the desired level of operational readiness in another service.

4.0 LOGISTICS SUPPORT TOOLS

There are several logistics support planning and management tools to assist the joint program manager and staff that are discussed below:

Integrated Logistics Support Plan (ILSP). DoD Directive 5000.39[2/] provides the policy and responsibilities for the acquisition and management of Integrated Logistics Support (ILS) programs as an integral part of the acquisition process and emphasizes the need for early ILS planning. The Program Manager should develop a draft Integrated Logistics Support Plan (ILSP) by Milestone I, complete it by Milestone II, and keep it current throughout the acquisition process. The ILSP shall integrate the logistics aspects of the program. Positive controls should be established to integrate schedules and to identify interdependencies among ILS elements, design activities and deployment plans. The ILSP should document readiness and support objectives and demonstrated achievements, Logistics Support Analysis (LSA) strategy, operating concepts and deployment requirements (including transportability), support concepts and plans, ILS element requirements, schedule, funding requirements and responsibility for ILS activity planned for each program phase.[6/]

The joint program manager and staff should normally prepare, coordinate and promulgate an initial draft ILSP during the Concept Exploration phase. The draft will provide a basis for participating services and contractor planning and for ILS planning in subsequent acquisition phases. By Milestone I, the ILSP should include specific tasks to be accomplished during the Demonstration and Validation Phase, identify the responsible service agencies and activities, and establish the schedule for task completion. The ILSP will also project requirements, tasks and milestones for future acquisition phases.

During the Demonstration and Validation phase and following acquisition phases, the ILS Manager of the joint program staff may obtain contractor assistance to review and update the ILSP. The plan will become progressively more detailed as the program design activity progresses. Prior to entering the Full Scale Development (FSD) phase, the update of the full scope ILSP should be completed by the ILS Manager. The update should reflect the results of the demonstrations and validations, include pertinent details from the contractor-prepared Integrated Support Plan (ISP), and describe the plan for the FSD phase.

During FSD and in subsequent phases, the ILSP should have continuous joint program office and contractor involvement in reviewing, refining, expanding, and updating the plan. The ILSP should be updated:

- When new program direction is received.
- When there are changes that involve personnel, training, facilities, or any other ILS elements.
- Before each milestone decision review.

The responsibility of the joint program office is to ensure that all milestones are listed, that the timing is correct, and coordination actions have been completed. The contractor should provide inputs as appropriate for ILSP updates.[7/]

The content and format of the ILSP should be tailored by the joint program ILS staff based on the needs of the specific program, however, each of the following items should be discussed as appropriate in the plan.[8/9/]

- *System Description* including Government Furnished Equipment (GFE), Government Furnished Material (GFM) and associated support items of equipment.

- *Organizational* responsibilities and relationships of agencies and organizations supporting the joint program office.

- *Operational and Organizational Concept* involving mission requirements, operational environment and other required LSA input parameters.

- *System Readiness Objectives* (SRO) for both peacetime and wartime situations

- *Logistics Acquisition Strategy* involving contractual approaches and incentives for LCC, Reliability & Maintainability (R&M) and supportability goals.

- *LSA Plan* which, due to its importance in realizing program and ILSP objectives, may be included as a separate document. This plan describes the approach to LSA and the results expected.

- *Supportability Test and Evaluation Concepts* involving identification of specific test issues related to overall ILS objectives and to each ILS element.

- *ILS Elements* should be addressed as to ILS objectives, concepts, trade-off factors, goals, thresholds, special requirements, responsibilities, and validation and verification requirements. The manner in which each applicable element of ILS is obtained and integrated with the other elements should be documented.

- *Support Transition Planning* describing the plans for transition from contractor to government support. The planning should involve each of the applicable ILS elements.

- *Support Resource Funds* involving ILS-related life-cycle funding requirements (funded and unfunded) should be identified by ILS element, program function and appropriation category.

- *Post Fielding Assessments* involving plans for analyzing and assessing field data feedback related to material support and support system performance. The plans should address assessment methodology, identify milestones and responsibilities and describe the strategies for improvements.

- *Milestone Schedule Charts* showing the interrelationships of specific logistic support related tasks and events to the overall program milestones and to each other.

Logistics Support Analysis (LSA)

The Logistics Support Analysis (LSA) program is described in MILSTD-1388-1A.[4/] The LSA program shall be established as an integral part of the system engineering process, with two primary goals in mind: first, to influence system design from the readiness and supportability point of view (following a "top-down" approach), and second, to identify logistic support-related resource requirements (using a "bottoms-up" approach). There are two key elements of

the LSA process that contribute to the integration process. The first is the establishment, within the design activity, of logistics oriented tasks that are directly relatable to such engineering efforts as reliability, maintainability, and standardization. The tasks are tailored to the specific characteristics of the engineering program. The second key element is the development of validated, integrated data bases and other sources of LSA documentation that can provide an audit trail for design analyses and decision rationales, as well as the basis for the identification of supportability-related resource requirements. The LSAR provides only a part of this documentation; other LSA documentation must be specifically identified in applicable Data Item Descriptions (DIDs) and cited in the Contract Data Requirements List (CDRL) for each individual program. The data system provides contractors an information system for accomplishing system engineering and is used to satisfy government data requirements. The LSA deserves the highest visibility within the joint program office. The advantages of such a common data base for individual logistics functions include reduced costs, shorter procurement leadtimes, and simplified data maintenance and documentation. In a joint program, there is the additional advantage of spreading the costs of developing an LSA data base over two or more services.

Use of LSA should facilitate the consolidation of the various data requirements generated by the participating services into a single cohesive contractual record. Although the consolidation of the requirements may appear to be difficult, carefully reviewing each service's requirements and allowing the service with the greatest requirements prepare a single set of contract requirements is a suggested approach.

The LSA requirements consist of five general task sections involving fifteen (15) tasks and seventy-seven (77) subtasks. The five general task sections are discussed below:[10]

- *Program Planning and Control.* Management of the LSA effort requires the development of a proposed LSA strategy, tailoring decisions, requirements for the LSA plan, and design reviews, procedures and schedules. The LSA planning and management is the responsibility of the joint program manager. If available, the ILSP provides guidance to the contractor.

- *Mission and Support System Definition.* The LSA effort is used to establish supportability objectives and supportability related design goals, thresholds, and constraints through comparison with existing systems and analyses of supportability, cost, and readiness drivers.

- *Preparation and Evaluation Alternatives.* These tasks are highly iterative in nature and are applicable to successive phases of the pre-production part of the life cycle and to production design changes. The tasks are generally performed in sequence and the process is then iterated to increasingly lower levels of detail in conjunction with the system engineering process.

- *Determination of Logistics Support Resource Requirements.* This portion of the LSA defines the requirements of the ILS elements. The tasks can be very costly and produce a considerable amount of documentation.

- *Supportability Assessment.* The supportability test and evaluation program is a vital part of the LSA process throughout a program life cycle. It should serve three objectives: (a) provide measured data for supportability design parameters as inputs to the sys-

tem engineering, Life-Cycle Costs (LCC), and support system design activities, (b) present supportability problems for corrective action, and (c) demonstrate contractual compliance with design requirements.

Logistics Support Analysis Record (LSAR)

The Logistics Support Analysis Record (LSAR) data requirements are detailed in MILSTD-1388-2A.[5/] The LSAR data are a subset of the LSA documentation and are generated as a result of performing the logistic support analysis tasks specified in MIL-STD-1388-1A. The MIL-STD-1388-2A is structured to accommodate the maximum range of data potentially required by all services in all ILS element functional areas for all types of material systems, and through the entire acquisition life cycle. This approach permits standardization of formats and data definitions for government-required LSA data. Tailoring of these data requirements is a vital part of the ILS effort. There are fourteen (14) LSAR standard data records. Figure 9-1 identifies these fourteen (14) data records and relates them to the applicable LSA tasks. There are many LSA tasks that are not documentated by the LSAR. The output of these tasks may be documents such as the contractor's LSA Plan (Task 102), alternative support systems (Task 302), and fielding analysis (Task 402). If task results are to be delivered to the government, the LSA program Statement of Work (SOW) must establish that requirement. The applicable Data Item Descriptions (DIDs) must be specified and delivery instruction cited on the Contract Data Requirements List (CDRL), DD Form 1423. The ILS managers should be aware of the amount of documentation that is available. Only the LSAR data that are required should be ordered by the joint program office. In other words, the ILS manager needs to determine what data are needed, and when. From this determination, identification of output reports, LSAR data records, and tasks required to meet the needs should be possible.

Tailoring the LSA/LSAR[11/]

Tailoring LSA. The key to a productive and cost-effective LSA program is proper tailoring of the LSA subtasks so that the available resources are concentrated on the tasks which will most benefit the program. Limitations on acquisition funding require that the LSA effort be applied selectively in order to improve hardware design and support concepts, not merely to collect data. The joint program ILS manager plays a significant role in the tailoring process. Appendix A to MIL-STD-1388-1A provides guidance in tailoring LSA requirements to fit the needs of a specific program.

Tailoring LSAR. Tailoring LSAR data is a mandatory requirement for acquisition programs. The tailoring decisions should be based on (a) the LSA tailoring process described in the preceding paragraph, (b) related engineering and ILS element analysis efforts that result in LSAR data, and (c) deliverable logistics products specified by DIDs to be included in the performing activity contract(s). In addition, LSAR data records utilization may be broken down by hardware level (system, subsystem, lowest repairable assembly, part, tools/TMDE/support equipment). Some data records are applicable to all hardware levels, and some are not applicable to any depending upon program requirements. Appendix E to MIL-STD-1388-2A provides detailed guidance for tailoring the LSAR.

It is DoD policy to require contractors, under the terms of their contracts, to provide recommendations for application and tailoring of LSA tasks and LSAR (as

DATA SHEET	RECORD TITLE	RELATED LSA TASK NO.
A	Operation and Maintenance Requirements	205
B	Item Reliability and Maintainability Characteristics	205,301 401,501
B1	Failure Modes Effects and Criticality Analysis	301
B2	Criticality and Maintainability Analysis	301
C	Operation and Maintenance Task Summary	301,401,501
D	Operation and Maintenance Task Analysis	301,401,501
D1	Personnel and Support Requirements	301,401,501
E	Support Equipment or Training Material Description and Justification	401,501
E1	Unit Under Test (UUT) and Automatic Program(s)	401,501
F	Facility Description and Justification	401,501
G	Skill Evaluation and Justification	401,501
H	Support Items Identification	401,501
H1	Support Items Identification (Application Related)	401,501
J	Transportability Engineering Characteristics	401,501

Figure 9-1 LSAR Data Records/Relationships[10]

well as other LSA documentation) requirements in one phase, for proposed application to the succeeding phase. DoD policy also specifies that the contractor's management system and data product formats shall be used, unless the contractor's approaches cannot satisfy the program needs.[12/]

Integrated Support Plan (ISP)

The Integrated Support Plan (ISP) is a contractor-prepared document that details the incorporation of ILS considerations during the design, development, and production processes of system acquisitions. This comprehensive plan should be used as a control and measuring device of the offeror's intended ILS program management, as well as the contractor's contemplated compliance with the specific ILS requirements of the joint program as stated in the Request for Proposal (RFP).

ISP activities may also be used to structure ILS studies and other deliverables for follow-on logistic effort. Pertinent portions of the IPS are usually incorporated into updates of the joint program office prepared ILSP. The ISP is an iterative document that must be accepted and approved by the Government. Data Item L-6138 provides preparation instructions. The contents of a contractor's ISP should include:

- Organization
- Responsibilities
- Schedules
- Major Tasks
- Sub-plans (*e.g.*, LSA, training, provisioning)
- Interrelationships among logistic elements
- External Constraints
- Other Pertinent Factors

5.0 SUMMARY

- All multiservice acquisition programs should use and follow the concepts and principles of ILS delineated in DoD Directive 5000.39 and the JLC joint directive - AR 700-129/ OPNAVINST 4105.2/AFR 800-43/MCO 11310.86.

- The overall objective of an ILS program is to field supportable systems/equipment in the planned operational environments that meet established system/equipment requirements or System Readiness Requirments at an affordable Life-Cycle Cost (LCC).

- The lead Service should designate an ILS manager prior to establishing an acquisition strategy to ensure that ILS considerations are properly included in the strategy.

- The participating services should each designate an ILS representative, and if possible, the representative should be co-located with the lead Service ILS manager.

- The ILS planning functions are essential to the successful integration of an equipment into operational use.

- Logistics planning must begin at the initial program milestone-program initiation.

- Early logistics R&D is designed to cost-effectively influence equipment design.

- A recommended content and format for a JILSP are described in Appendix D.

- Each service has different missions, operating concepts, and operating environments, as do standard practices, procedures and doctrines for providing logistic support.

- There are several logistics support planning and management tools to assist the program manager and staff. The primary tools are listed below:

  - The Integrated Logistics Support Plan (ILSP),

  - The Logistics Support Analysis (LSA),

  - The Logistics Support Analysis Record (LSAR), and

  - The Integrated Support Plan (ISP).

REFERENCES AND FOOTNOTES:

1/ "Integrated Logistics Support Guide," DSMC, May 1986. p. 17-1.

2/ DoD Directive 5000.39, "Acquisition and Management of Integrated Logistic Support for Systems and Equipment," 17 November 1983.

3/ AR 700-129/OPNAVINST 4105.2/AFR 800-43/MCO 11310.86, "Management and Execution of Integrated Logistic Support (ILS) Programs for Multiservice Acquisitions," 1987.

4/ MILSTD-1388-1A, "Logistic Support Analysis."

5/ MILSTD-1388-2A, "DoD Requirements for a Logistic Support Analysis Record."

6/ "Program Manager's Notebook," DSMC, October 1985. p. 3.9a.

7/ "Integrated Logistics Support Guide," DSMC, May 1986. pp. 2-2 & 2-3.

8/ "Program Manager's Notebook," p. 3.9c.

9/ MILSTD-1369A, "Integrated Logistic Support Program Requirements."

10/ "Program Manager's Notebook," pp. 3.9.1c-3.9.1d.

11/ "Program Manager's Notebook," p. 3.9.1e.

12/ DoD Directive 5000.43, "Acquisition Streamlining," 15 January 1986, p. 3.

CHAPTER 10

TEST AND EVALUATION

1.0 SYNOPSIS

Test and Evaluation (T&E) is primarily concerned with making a direct contribution to the development, production, and fielding of a system which meets users' requirements in the case of multiservice acquisition programs. In addition, the demonstration of a system's technical capability, operational effectiveness, and suitability are key to the release of additional funds and to the decision to advance a development to the next phase. Section 2.0 of this chapter will discuss the background of T&E, Section 3.0 will discuss independent agencies and offices, Section 4.0 will address Test and Evaluation Master Plans (TEMP), and Section 5.0 will summarize the chapter.

2.0 BACKGROUND

DoDD 5000.3, "Test and Evaluation," provides the DoD policy concerning T&E, establishes the responsibilities of OSD level T&E related offices, and authorizes the issuance of a set of T&E related manuals as follows:[1/]:

- DoD 5000.3-M-1, "Test and Evaluation Master Plan Guidelines."
- DoD 5000.3-M-2, "The Department of Defense Foreign Weapons Evaluation Program."
- DoD 5000.3-M-3, "Software Test and Evaluation Manual."
- DoD 5000.3-M-4, "Joint Test and Evaluation Procedures Manual."
- DoD 5000.3-M-5, "Procedures Manual - Improving Test and Evaluation Effectiveness in Support of the Major Weapon Systems Decision Process."

The first manual was issued 8 October 1986. The remaining documents are currently in various stages of development and review. In addition, DoD 5000.3-M-4 will replace the current Joint Procedures Manual.[2/]

Each service has its own T&E regulation which implements the DoD directive, and amplifies the requirement of system conception-to-fielding test and evaluation.

The major tasks of test and evaluation in a system development and acquisition program are to assist in the design process of the system and to address the areas of risk as detailed in the DCP and the program charter or directive. T&E is conducted to demonstrate feasibility, to minimize design risks, and to determine the design alternatives and trade-offs necessary to best achieve program objectives during the demonstration and validation phase of the acquisition process. During the Full-Scale Development (FSD) phase, T&E progresses from component through subsystem tests, to full system tests. The objectives then are to further determine that design risks are minimized, prior to the FSD phase, that the system design is complete, that the system's military utility will justify production, and primarily to assess compliance with system requirements. Although development testing will predominate T&E considerations during this phase, operational testing must have been conducted to satisfy the questions concerning operational effectiveness and suitability before a decision can be made to enter the FSD phase.

For some time prior to about 1970, the emphasis in the acquisition of defense systems was on "total package procurement" - a contract was let for a

complete system development and procurement program after an initial paper study and definition phase. The theory was that if a program or system was sufficiently defined at the outset, a contractor could be expected to deliver the required product at a predetermined cost. The concept of total package procurement was not totally successful for a number of reasons, such as: overoptimistic cost and performance estimates, and inaccurate initial definitions. The programs often experienced large cost overruns and significant performance deficiencies.

Several groups - the Blue Ribbon Defense Panel, the Commission on Government Procurement and the Defense Science Board - recognized the deficiencies of these practices. Partly as a result of their recommendations, new policies evolved that emphasized demonstrated performance as the pacing function for defense acquisition programs. The key feature of the new policies is the periodic review of the programs at critical milestones. During these periodic reviews by the Joint Requirements Oversight Council (JROC) and the Defense Acquisition Board (DAB) (for major systems), program progress is compared with program goals and objectives, and a decision is made to continue, redirect or cancel the program.

For such comparisons to be effective, reliable and accurate measurements of program progress are necessary. Test and evaluation, the primary means for making such measurements, became the cornerstone of the new acquisition policies and were emphasized in their implementation. In addition to the two primary offices within OSD concerned with T&E, the Director, Operational Test and Evaluation (DOT&E), and the Deputy Under Secretary of Defense, Test and Evaluation DUSD(T&E), each service established, or gave new emphasis to, independent operational test agencies and headquarters staff focal points for conducting the required test and evaluation. While the DUSD(T&E) reports to the USD(A), the DOT&E is an independent element within the OSD. In this regard, the services publish an annual memorandum of agreement on multiservice operational T&E and joint T&E. (See Appendix C for the MOA published in 1986.)

Types of Test and Evaluation

The two principal types of test and evaluation conducted in the acquisition process are Development Test and Evaluation (DT&E), and Operational Test and Evaluation (OT&E). DT&E is conducted by or under the supervision of the development agency to evaluate technical performance of prototype equipment. This testing is generally conducted by engineers and technicians - either contractor or government - in carefully controlled conditions. OT&E, on the other hand, is conducted exclusively by military personnel to determine the degree to which new equipment fulfills military operational requirements. It is, as a rule, conducted under conditions that duplicate, as closely as possible, the environment in which the equipment is expected to perform when deployed.

These assessments serve important functions in the acquisition process. DT&E assists in the actual design and development of a system in which initial designs are converted to hardware. It is an iterative process of test, note deficiencies, and fix deficiencies. DT can be used to validate - providing the necessary feedback for an orderly progression from initial design through engineering model stages to production prototype. Additionally, DT&E provides information on the progress of new system development. The progress is ascertained by comparing measured system

performance with a set of technical goals and objectives for the program. A principal contribution of DT&E, especially prior to Full-Scale Development phase, is the assessment of alternative system concepts and technical approaches. DT should be oriented to showing engineering progress toward resolving the operational issues.

OT&E, like DT&E, also provides essential information for decision-making by comparing system operational performance with operational objectives. Generally speaking, the final phase of an Initial Operational Test and Evaluation (IOT&E) OPEVAL is conducted with one of the Low Rate Initial Production (LRIP) articles. If in fact an OPEVAL is not conducted with a production representative test article, then a Follow-on Operational Test and Evaluation (FOT&E) is required.

Combined DT&E and OT&E are often conducted, especially early in the development of large, expensive systems or systems which will have a small number produced and fielded. Table 10-1 illustrates the services' T&E phases in relation to acquisition milestones and phases.

T&E for Special Acquisition Programs includes the application of DT&E principles to systems which are acquired at a low rate over a long period of time such as ships, space systems, and unique platforms. Software T&E is gaining in importance as may be noted from the plan to issue the, "Software Test and Evaluation Manual," as cited above. The testing aspects of software include testing against mission objectives, the articulation of quantitative goals and thresholds, and the institutionalization of an approach to improve the flow of information concerning software testing within the military services and OSD.

3.0 INDEPENDENT T&E AGENCIES

One of the key recommendations of the Blue Ribbon Defense Panel implemented by SECDEF is the policy requiring each service to maintain a major field agency, separate and distinct from both the developing or procuring activity and the eventual user activity, to be responsible for the conduct of OT&E and the monitoring of DT&E. Each such agency is required to report the results of independent OT&E, normally by Independent Evaluation Reports (IER), directly to the service chief, and to the Defense Acquisition Executive when appropriate. The services' independent OT&E agencies are as follows:

- ARMY-U.S. Army Operational Test and Evaluation Agency (OTEA), 5600 Columbia Pike, Falls Church, Virginia 22041;

-NAVY-Commander Operational Test and Evaluation Force, (COMOPTEVFOR), Norfolk, Virginia 23511;

-MARINE CORPS-Marine Corps Operational Test and Evaluation Activity (MCOTEA), Quantico, Virginia 22134; and

-AIR FORCE-Air Force Operational Test and Evaluation Center (AFOTEC), Kirtland Air Force Base, New Mexico 37117.

The foregoing organizations were established by the services to fulfill the "independent OT&E" requirements of DoD policy. Each service has other activities tha perform testing functions, generally within its development and acquisition structure. These activities are configured and staffed to conduct technical, development, and test evaluations. These activities are normally specified for particular test support in a program's charter or charter-implementing docu-

TABLE 10-1 TEST AND EVALUATION PHASES

ACQUISITION MILESTONE	0	I	II	III
ACQUISITION PHASE	CONCEPTUAL	DEMONSTRATION & VALIDATION	FULL-SCALE DEVELOPMENT	PRODUCTION &DEPLOYMENT
ARMY T&E DT&E OT&E	 TFT CEP	 DT EUTE	 PPT IOT	 PQT, FPT FOT
NAVY T&E DT&E OT&E	 NOT CATEGORIZED NOT CATEGORIZED	 DT I OT I	DT II OT II (NOE) TECH EVAL OPEVAL (FINAL OT II)	 DT III FOT&E/(OT III, OT IV)
AIR FORCE T&E DT&E OT&E	 DT&E IOT&E			 FOT&E I FOT&E II

NOTES:

1. TFT: ARMY — TECHNICAL FEASIBILITY TEST
2. CEP: ARMY — CONCEPT EVALUATION PROGRAM
3. DT: ARMY — DEVELOPMENT TEST
4. EUTE: ARMY — EARLY USER TEST AND EXPERIMENTATION
5. PPT: ARMY — PRODUCTION PROVE TEST
6. IOT: ARMY — INITIAL OPERATIONAL TEST
7. PQT: ARMY — PRODUCTION QUALIFICATION TEST
8. FPT: ARMY — FOLLOW—ON PRODUCTION TEST
9. FOT: ARMY — FOLLOW—ON OPERATIONAL TEST
10. FOT&E: NAVY — FOLLOW—ON OPERATIONAL T&E
11. NOE: NAVY — NAVY OPERATIONAL EVALUATION (OPEVAL)
12. FOT&E I: AIR FORCE — FOLLOW—ON OPERATIONAL T&E I
13. FOT&E II: AIR FORCE — FOLLOW—ON OPERATIONAL T&E II

mentation (*e.g.*, the Test and Evaluation Master Plan [TEMP]) to provide test and/or evaluation support either independently or as monitor agency for contractor DT&E efforts.

The Department of Defense's Office of Operational Test and Evaluation (OT&E) has established a Defense Test and Evaluation Council that will review the test resources requirements of the military services and make recommendations to avoid duplication of efforts and to use test assets more efficiently.

In 1978, the Joint Logistics Commanders (JLC) established a Test and Evaluation Planning Guidance *Ad Hoc* Group which was subsequently dissolved after its task was completed. Its assigned task was to "assess the joint testing environment as it existed in the late 1970s, determine the best approach to resolve deficiencies in existing directives, and develop appropriate policy and guidance for greater commonality of test and evaluation effort." Since the JLC are individually the service material development and logistics commanders, and since the membership of the *Ad Hoc* Group represented development T&E interests, the group's implicit focus was on DT&E. The group conducted a thorough review of T&E regulations and, with the assistance of its OT&E counterparts, polled test managers of over twenty joint programs.

Some of the direct results of the T&E *Ad Hoc* Group's work are in evidence. Changes to service regulations were initiated which required joint program testing to be performed in accordance with the directives of the executive service, consistent with JLC's Multiservice Program Management Directive. A *Compendium of Test Terminology* was compiled, published, and made available to the T&E community.[3/] Every joint program manager and multiservice T&E director will still find the compendium invaluable.

Subsequently, a multiservice DT&E Commanders' Conference recommended that an *Ad Hoc* Group be established as a permanent joint acquisition DT&E interface and focal point with the JLC. That recommendation was implemented by the issuance of a joint regulation which requires semi-annual meetings of the Group, undertaking of items recommended by the recurring Multiservice DT&E commander's Conference, annual review of the *Compendium of Terms* and coordination with the OT&E community on appropriate issues.

The joint program manager and his test organization should take advantage of the continuing work done by the Group, whose members are:

Air Force

- HQ AFSC/TEVP (Office of primary responsibility for convening meetings)
  Andrews AFB
  Washington, D.C. 20334-5000

- HQ AFLC/MMA
  Wright-Patterson AFB
  Ohio 45433-5001

Army

- HQAMC/AMCQA-ST
  5001 Eisenhower Avenue
  Alexandria, Virginia 22333-0001

- TECOM/DRSTE-TO-P
  Aberdeen Proving Ground
  Aberdeen, Maryland 21005-5055

Navy

- CNO (OP-04)
  Washington, D.C. 20350-2000

- NAVAIR (AIR-01)
  Washington, D.C. 20361-1000

Marine Corps

- Director, Development Center
  D050-3
  MCDEC
  Quantico, Virginia 22134-5000

Coincidental to this work towards commonality in development T&E, the OT&E Commanders, who currently meet to discuss mutual issues on a quarterly basis, appointed an *Ad Hoc* Group for Joint Service Testing in July 1978. This Group is producing an annual Memorandum of Agreement on Multiservice OT&E and Joint T&E, as cited in section 2.0 of this chapter, and intends to expand the agreements, as well as address other areas highlighted by the OT&E Commanders.

In 1979 the Joint Logistics Commanders promulgated guidance entitled, "Joint Service Interface on Development Test and Evaluation (DT&E)."[4/] This guidance provides for regular meetings to be held at least every six months wherein potential DT&E issues will be discussed.

There is great potential for misunderstanding the multiservice environment because common or nearly common terms do not always have the same meaning in the different services. For example, consider the (deceptively) simple word "initial." When included in a phrase that has wide application and understanding such as Initial Operational Capability (IOC), the Joint Dictionary meaning prevails, and mutual understanding is facilitated. But unique application of the word in another, single-service environment may give rise to misunderstanding. For example, the Navy and Air Force describe IOTE as an activity that can occur in the Demonstration & Validation and Full Scale Development Phases while the Army conducts Initial Operational Test in the Full Scale Development Phase only.

As a rule, particular communities throughout the services are aware of service-peculiar practices. Activities which cut across service borders, such as those undertaken by professional societies and the Joint Logistics Commanders have promoted wider understanding of service-peculiar concepts and terminology by members of specific disciplines such as financial managers and logisticians. Of course, these disciplines occasionally develop phraseology whose shades of meaning are understood within the community, but not outside, irrespective of service association. The operational testing community, for instance, has found it necessary to make a specific distinction between "joint testing" and "multi-service" testing. The commanders of the services' independent operational test organizations have agreed that "joint T&E" means an OSD sponsored T&E program structured to evaluate system operational or technical performance under realistic conditions with two or more services participating or with interrelated/interacting systems" for the purpose of providing information required by Congress, OSD, Commanders of Unified and Specified Commands, or DoD components. "Multiservice OT&E" means "OT&E conducted jointly by two or more services for systems to be acquired by more than one service, or for a service's systems which have interfaces with equipment of another service." This distinction was made to allow the service test organizations to differentiate between their acquisition-oriented test activity and that mandated by Department of Defense Directive 5000.3 under the direction of the Director, Operational Test and Evaluation (DOT&E). Thus, the manager of a joint service acquisition program will probably be advised that "multiservice" rather than "joint testing" must be accomplished to fulfill the program's requirements.

4.0 TEST AND EVALUATION MASTER PLAN

- The Test and Evaluation Master Plan (TEMP) required by Department of Defense Directive 5000.3 is recognized throughout the test community as the controlling management document for identification and integration of all objectives, responsibilties, resources, and schedules for all aspects of T&E.

- The TEMP is a formal and stand-alone document. Department of Defense Directive 5000.3 includes guidelines for the content and format of TEMPs. DoD 5000.3-M-1, "Test and Evaluation Master Plan Guidelines," provides expanded TEMP guidance. Briefly, the TEMP, or combination of TEMP supporting documents (System Test Plan [STP], and Program Introduction Document [PID] - Air Force, Outline Test Plan [OTP], and Test Design Plan [TDP-Army]) must contain:

- System description and intended operational mission,

- Critical T&E issues,

- Test objectives, and

- Required technical and operational characteristics, goals, and thresholds.

- Integrated schedule including contracting demonstrations, technical evaluations (Navy), Qualification OT&E (Air Force), in-process review (Army, less-than-major systems), type classification (Army), approval for limited and/or full production (Navy), as well as required "standard" development and operational T&E and program milestones.

- T&E resources required, including laboratory, ranges, test sites, instrumentation, major command or fleet (Navy) support needs, personnel, personnel training, logistic support, and funding by program element and appropriation per fiscal year.

For major acquisition programs, OSD approval of the TEMP is a requirement for Milestone I and all subsequent milestones. Clearly the TEMP, like the Program Management Plan (or Joint Development Plan) which it supports, as well as the Integrated Logistics Support Plan, must be started early. The Test Division (Directorate or Joint Test Office), of the joint program office must work in close cooperation with the lead service organizations responsible for DT&E and OT&E, as specified earlier in this chapter. These organizations must integrate test and evaluation requirements of the specific program with those of other programs.

Service T&E directives specify that its T&E regulations will be followed for multiservice testing for which it is the lead service (*e.g.*, OPNAVINST 3960.10B[5/] states that when the Navy is lead service in a multiservice acquisition program, multiservice T&E will be conducted as outlined in the instruction. Further, tests conducted by a single service will be conducted under its own regulations. OT&E for multiservice programs should be planned, conducted, and reported by each service's independent OT&E agency; however, close cooperation between these agencies and detailed integration of OT&E plans should be achieved to minimize duplication.

The joint program manager should expect the test manager of the joint program office to promote specific testing by a single, consolidated - that is, with all interested services participating - test group whose reports would be available to service agencies for independent evaluations. (The procedure of "joint testing and independent evaluation" was a specific recommendation of the Defense Science Board's Acquisition Cycle

Task Force.) Championing that cause might be one of the most significant acts a joint program manager can perform to prevent proliferation of separate service testing from slowing the PM's program.

5.0 SUMMARY

- Successful accomplishment of Test and Evaluation (T&E) objectives is a key requirement for decisions to commit significant additional resources to a program, or to move from one acquisition phase to the next. T&E assists in the resolution of Critical Operational Issues that are identified in the DCP or other applicable service requirement documents.

- There are two principal types of T&E conducted in the acquisition process: Development T&E (DT&E) and Operational T&E (OT&E).

- DT&E is conducted by or under the supervision of the development agency to evaluate the technical performance of prototype equipment. Usually conducted by engineers and technicians, either contractor or government, under carefully controlled conditions.

- OT&E is conducted exclusively by military personnel to determine the degree to which the new equipment will fulfill military operational effectiveness and operational suitability, including supportability, as well as the need for any modifications. Usually conducted under conditions that duplicate, as closely as possible, the environment in which the equipment is expected to perform when deployed.

- The services publish an annual MOA on multiservice operational T&E and joint T&E. (See Appendix C)

- Each of the services has independent OT&E agencies that are identified in section 3.0 of this chapter.

- DoD's office of OT&E has established a Defense Test and Evaluation Council to review the test resources of the military services and make recommendations to avoid duplication of efforts and to use test assets more efficiently.

- *A Compendium of Test Terminology* is available to assist in clarifying redundant test terminology.

- The TEMP, as specified by DoDD 5000.3, is the controlling management document for identification and integration of all objectives, responsibilities, resources, and schedules for all aspects of T&E.

- Service T&E directives provide guidance to be followed for multiservice testing for which it is the lead service.

REFERENCES AND FOOTNOTES:

1/ DoDD 5000.3, "Test and Evaluation," March 1986.

2/ "Joint Test and Evaluation Procedures Manual," September 1980.

3/ Compendium of Test Terminology, December 1978, compiled by the Joint Logistic Commanders' Ad Hoc group on test and evaluation planning guidance.

4/ AFSC/AFLC Regulation 80-24/DARCOM REGULATION 70-64/DCO 5000.2, "Joint Services Interface on Development Test and Evaluation," May 1979.

5/ OPNAVINST 3960.10B, "Test and Evaluation."

CHAPTER 11

SECURITY

1.0 SYNOPSIS

Security covers both classified and unclassified facilities, system hardware and software, and also documentation, that requires protection and special handling procedures. Unclassified technical software or hardware may be subject to restriction in terms of distribution based upon such reasons as "Foreign Information," "Proprietary Equipment or Data," or "Test and Evaluation." OSD has issued DoD Directive 5200.1, "DoD Information Security Program,"[1/] DoD Directive 5200.8, "Security of Military Installations and Resources,"[2/] and DoD Directive 5230.24, "Distribution Statement on Technical Documents,"[3/] as guidance in this area. Section 2.0 of this chapter discusses the development and application of security classification guides by the joint program office, section 3.0 addresses the control and security of unclassified technical software and hardware, and business information and data. Section 4.0 discusses system security engineering management, and section 5.0 summarizes the chapter.

2.0 SECURITY CLASSIFICATION GUIDES

The DoD Information Security Program (ISP) is outlined in DoD Directive 5200.1 and supported by a series of handbooks, including:

- DoD 5200.1-H, "Department of Defense Handbook for Writing Security Classification Guidance," March 1986.
- DoD 5200.1-I, "Index of Security Classification Guides," July 1983.
- DoD 5200.1-PH, "A Guide to Marking Classified Documents," November 1982.
- DoD 5200.1-PH-1, "Classified Information Nondisclosure Agreement," July 1985.
- DoD 5200.1-R, "Information Security Program Regulation," June 1986.

These handbooks support the DoD policy with reference to information security which is:

> ". . . to assure that information that warrants protection against unauthorized disclosure is properly classified and safeguarded as well as to facilitate the flow of unclassified information about DoD operations to the public."[4/]

- In addition, there are a number of classified DoD Directives 5200 series that cover security of systems. (See DoD 5025.1-I.)[5/]

The charter for a joint program should include a discussion of the security program, the responsibility for issuance of security guidance and the identification of the command or office which will provide security assistance to the program as required. The Security Guide for the program must be developed early in the program and ideally prior to initial funding.

The guide itself should be structured in such a manner that it provides the clearest guidance possible, and be in a form that encourages use and review. The Program Manager's Notebook, Fact Sheet No. 7.6 discusses the development of Security Guides.[6/] The points presented below are summarized from the Fact Sheet.

- The guide should be prepared by an individual in the program who is well versed in the overall acquisition. When planning a joint program, this will involve close coordination with techni-

cal/management personnel from each participating service.

- The wording of the guide must be as clear and unambiguous as possible so as to minimize any possible misunderstanding which could lead to the compromise of classified equipment, technology, software or information. Program peculiar phrases and acronyms should be used only when absolutely necessary.

- The format of the guide should reflect the best qualities of service formats. As stated above, the guide should encourage use by being logically developed and indexed, with sufficient examples to provide for a wide range of applications.

- The development of a security guide should follow a certain sequence of steps which will assist in its preparation. DoD Handbook 5200.1-H[7/] provides detailed guidance, expanding on the steps cited below:

Step 1 - Ensure that current guidance for related programs or systems is reviewed and any generic guidance is consulted.

Step 2 - Review the state of the art of the technology, including discussions with the supporting Foreign Intelligence Office.

Step 3 - Identify those factors which give an advantage to the United States in terms of capabilities, exclusive knowledge, manufacturing, etc.

Step 4 - Make an initial classification determination.

Step 5 - Identify specific items of software and hardware that require classification.

Step 6 - Determine how long the classification must last. This includes downgrading and declassification.

Step 7 - The actual writing of the guide.

- The guide should be approved by the official who can originally classify at the highest level, and has supervisory responsibility for the information.

The development and application of a well written security guide will not only assist in the protection of security information, but also provide a solid foundation for formalizing information handling and disposition.

3.0 CONTROL OF TECHNICAL INFORMATION

Technical information which is developed by the Department of Defense often requires limitations on dissemination for a variety of reasons including the results of test and evaluations, foreign information, etc. The joint program manager and technical and administrative staff personnel must be aware of when and why to restrict technical information, and to take such actions that will support the policies promulgated in DoD Directive 5230.24, "Distribution Statement on Technical Documents."[8/] All technical documentation generated within the program must be assigned appropriate distribution codes, and technical documents, including informal working papers and memoranda which are not in the public domain but may be released outside DoD must also include distribution statements. There are seven (7) distribution statements currently approved for technical documents. These seven distribution statements and their reasons for use are found in Enclosure (3) to DoD Directive 5230.24, and are summarized below:

DISTRIBUTION STATEMENT A - Approved for public release; distribution is unlimited.

- Only for unclassified technical data cleared in accordance with DoD Directive 5230.9, "Clearance of DoD Information for Public Release."[9]

- Documents with this statement may be sold and exported.

DISTRIBUTION STATEMENT B - Distribution authorized to U.S. Government agencies only (fill in reason) (date of determination). Other requests for this document shall be referred to (insert controlling DoD office).

- This statement may be used on unclassified or classified technical documents.

- Reasons for assigning distribution statement B includes:

- *Foreign Government Information* - To protect and limit distribution.

- *Proprietary Information* - To protect information not owned by the U.S. Government by a contractor's "limited rights" statement, or received with the understanding that it not be routinely transmitted outside the U.S. Government.

- *Test and Evaluation* - To protect results of test and evaluation of commercial products or military hardware when such disclosure may cause unfair advantage or disadvantage to the manufacturer of the product.

- *Contractor Performance Evaluation* - To protect information in management reviews, records, of contract performance evaluation, or other advisory documents evaluating programs of contractors.

- *Administrative or Operational Use* - To protect technical or operational data or information from automatic dissemination under the International Exchange Program or by other means.

- *Software Documentation* - Releasable only in accordance with the provisions of DoD Instruction 7930.2, "ADP Software Exchange and Release."[10]

- *Specific Authority* - To protect information not specifically included in the above reasons and discussions, but which requires protection in accordance with valid documented authority such as Executive Orders, classification guidelines, DoD or DoD Component regulatory documents.

DISTRIBUTION STATEMENT C - Distribution authorized to U.S. Government agencies and their contractors (fill in reason)(date of determination). Other requests for this document shall be referred to (insert controlling DoD office).

- May be used on unclassified technical documents or on classified technical documents.

- Reasons for assigning distribution statement C include:

- *Critical Technology* - To protect information and technical data that advance current technology or describe new technology in an area of significant or potentially significant military application or that relate to a specific military deficiency of a potential adversary.

- *Administrative or Operational Use* - Same as distribution statement B.

- *Specific Authority* - Same as distribution statement B.

DISTRIBUTION STATEMENT D - Distribution authorized to the Depart-

ment of Defense and DoD contractors only (fill in reason)(date of determination). Other requests shall be referred to (insert controlling DoD office).

- May be used on unclassified technical documents or on classified technical documents.

- Reasons for assigning distribution statement D include:

- *Premature Dissemination* - To protect information on systems or hardware in the developmental or conceptual stage to prevent premature dissemination.

- *Software Technology* - Same as distribution statement B.

- *Critical Technology* - Same as distribution statement C.

- *Specific Authority* - Same as distribution statement B.

DISTRIBUTION STATEMENT E -Distribution authorized to DoD Components only (fill in reason)(date of determination). Other requests shall be referred to (insert controlling DoD office).

- May be used on unclassified technical documents or on classified technical documents.

- Reasons for assigning distribution statement E include:

- *Export Limitations* - Document contains export-controlled technical data which has been designated by competent authority in accordance with DoD Directive 5230.25, "Withholding of Unclassified Technical Data from Public Disclosure."[11/]

- *Foreign Government Information* - Same as distribution statement B.

- *Premature Dissemination* - Same as distribution statement D.

- *Software Documentation* - Same as distribution statement B.

- *Critical Technology* - Same as distribution statement C.

- *Specific Authority* - Same as distribution statement B.

DISTRIBUTION STATEMENT F - Further dissemination only as directed by (insert controlling DoD office)(date of determination) or higher DoD authority.

- Normally used only on classified technical documents, but may be used on unclassified technical documents when specific authority exists.

- Distribution statement F is used when the DoD originator determines that information is subject to special dissemination limitation specified by paragraph 4-505, DoD 5200.1-R, "Information Security Program Regulation."[12/]

- When a classified document assigned distribution statement F is declassified, the statement shall be retained until the controlling DoD office assigns the proper distribution statement from this Directive.

DISTRIBUTION STATEMENT X - Distribution authorized to U.S. Government agencies and private individuals or enterprises eligible to obtain export-controlled technical data in accordance with regulations implementing 10 U.S.C. 140c (date of determination). Other requests must be referred to (insert controlling DoD office.)

- This statement shall be used on unclassified documents when distrubtion statements B, C, D, E, or F are not ap-

plicable, but the document does contain technical data as explained in DoD Directive 5230.25 cited above.

- This statement shall not be used on classified technical documents; however, it may be assigned to technical documents that formerly were classified.

The selection of the distribution statement to be used must be thoroughly reviewed and then implemented so as to ensure that there are proper physical controls to accomplish the intent. In today's highly competitive defense arena it is even more important to properly and equitably control the release of technical data.

4.0 SYSTEM SECURITY ENGINEERING MANAGEMENT

The System Security Engineering (SSE) Management Program has been developed and implemented by the Air Force and is suggested for use by joint program offices. Detailed procedures are presented in AFSCP 207-1,[13] and should be modified to meet the needs of a joint program office. An overview of the SSE Management Program is presented below:

Background. In the past, communications security was only applied to development systems and absorbed in C^3 subsystem development; physical security was applied to nuclear weapons or was dealt with during deployment and administratively treated as a nuclear safety problem; and operational security and information security were often deferred to deployment. Some systems were developed without adopting a good security program in the very beginning of the system's development. It was believed that potential security vulnerability would be addressed by attaching external equipment, implementing administrative procedures, or adding security personnel when the system was deployed. Recently, the threat, such as human intelligence (HUMINT), signal intelligence (SIGINT), transnational terrorism, and unconventional warfare and the new modes of deployment and dispersal; that is, tactical nuclear forces, have caused security issues to become critical during acquisition decisionmaking. SSE has become a formal discipline and ensures that security is addressed at the time the design for the system is being conceptualized and throughout all the phases of the system acquisition.

The SSE Management Program. The procedures of the program define the methods and actions needed to determine system or equipment vulnerability to ground-initiated overt or covert attacks by an adversary. It also firmly establishes life cycle physical security in weapon and Command, Control, Communications, and Intelligence (C^3I) systems as a condition of applying engineering and design principles and developing required countermeasures and procedures.

SSE Management Program Objectives. The following are the major objectives of the program:

- Provides to the acquisition or development of systems, the management and engineering functions needed for developing system hardware, software, and procedures that will satisfy the requirements for physical and information security, Operational Security (OPSEC), Communications Security (COMSEC), and Electronic Security (ELSEC).

- Ensures that system acquisition or development includes steps to counteract postulated or known system vulnerabilities and to firmly establish system security as the result of effectively applying those steps.

- Eliminates through engineering and design any characteristics that could re-

sult in the deployment of systems with operational security deficiencies.

- Makes sure aerospace weapon and support systems meet Department of Defense (DoD)-specified security requirements.

- Assists industrial and DoD capabilities expand in technologies that identify, measure, and mitigate security vulnerabilities in weapon and support systems.

- Identifies illicit interference against a system or subsystem that could succeed in:

  - Preventing the system from completing its mission.

  - Allowing the system to be used in a way that could be interpreted as the beginning of an armed attack by the United States.

  - Causing an incident, such as an in-place nuclear explosion or loss of custody, to occur that would embarrass the United States.

- Specifies the detection, alarm discrimination, and response functions that are required to compensate for residual vulnerabilities.

- Qualitatively and quantitatively defines operational security requirements.

Relationships to Other Programs. Sometimes the security program satisfies system requirements by providing a security response capability; other times, it is a part of an overall analysis and presents alternatives to prevent introducing a security vulnerability into the system design:

- SYSTEM ACQUISITION. System security is an element of systems acquisition and, as such, must be compatible with the activities and goals of system acquisition in its various phases.

- SYSTEM ENGINEERING. Security requirements are distinct design criteria that become part of the engineering design. They appear in functional descriptions and trade-off loops. They are defined and documented through functional analyses in the same way as operational design criteria are. Sometimes, security criteria influence the design of contract items that are not part of the security subsystem. And sometimes, they affect the design of the weapon system and eliminate the need for security subsystem hardware.

- THE SURVIVABILITY AND VULNERABILITY PROGRAM. Security vulnerability analyses contribute to and become part of the overall survivability and vulnerability analyses, which determines whether or not a weapons system can survive an abnormal hostile environment. Part of the data for survivability and vulnerability analysis is output from security vulnerability analyses or vice-versa. The survivability and vulnerability analyses address a wider range of threats and environment (mission profile), than do the security vulnerability analyses. The latter examine the possibilities of exploiting each vulnerability of the system to ground launched adversary assaults and consider the occurrence of a single malevolent act that exploits a security vulnerability as unacceptable.

- THE SYSTEM SAFETY PROGRAM. The security system is subject to safety analysis because it uses facilities, hardware, people, and equipment that must be kept safe. Also system requirements for safety are often implicit in the requirements for security. For example, the procedures used for safety and for security of nuclear resources often minimize deliberate and accidental acts against those resources. Nuclear

safety requires the imposition of the two-person concept and nuclear security specifies entry control, response procedures, and procedures for enforcing the two-person concept. Nuclear safety analyses tell system security engineers how much time and how many tools someone would need to access the system's critical components. Security vulnerability analyses tell nuclear safety engineers how many people will use what tools to attack the system and when those people will attack the system.

- SITING OF REAL PROPERTY FACILITIES. Facilities and access-road siting criteria affect the design of the security system because the responsiveness of security forces is affected by where the facility is located.

- CONTRACTOR MANAGEMENT. The relationships contractors have with associate and integrating contractors and subcontractors influence the effectiveness of system security during system design.

Relationship to Other Security Programs. There are a number of relationships with other security programs that complement or interact with each other as discussed below and illustrated in Figure 11-1:

- THE PHYSICAL SECURITY PROGRAM. This program counters physical security vulnerabilities not correctible by design. SSE integrates the physical security requirements of COMSEC, nuclear safety, chemical and biological defense, etc., into total system security.

- THE PERSONNEL INVESTIGATION, SECURITY CLEARANCE, AND ACCESS CONTROL PROGRAM. This program sets up a way to assign loyal, trustworthy individuals to sensitive positions. It is augmented by the personnel reliability program (PRP) of the SSE management program, which verifies that otherwise loyal and trustworthy individuals are stable enough to have access to nuclear weapons.

- THE INFORMATION SECURITY PROGRAM. This program sets the criteria for assigning information security classification and the requirements for handling known or suspected compromise. Based on these criteria and requirements and on the results of SSE analyses, the program managers and system security engineers decide how to classify system security information.

- THE INDUSTRIAL SECURITY PROGRAM. This program and the SSE management program mesh because SSE defines critical security problems that need to be resolved within the framework of DoD 5220.22-M, Industrial Security Manual (ISM) for Safeguarding Classified Information. SSE also identifies and supports requirements that deviate from normal practice as set up in the ISM.

- COMSEC. COMSEC analyses contribute to security vulnerability analyses. They describe the deterrent value of technical barriers and identify threats to COMSEC subsystems. COMSEC protects communications essential for operation of the system, including the security system. And SSE protects and controls access to COMSEC elements. SSE coordinates and integrates COMSEC and other USAF security program elements when functions, facilities, and procedures have multiple security roles.

- OPSEC. OPSEC assesses the extent to which each operational, administrative, and logistical activity affects system security. It specifically assesses research and development programs and acquisition of weapon and command and control and communications systems (AFR 55-30).

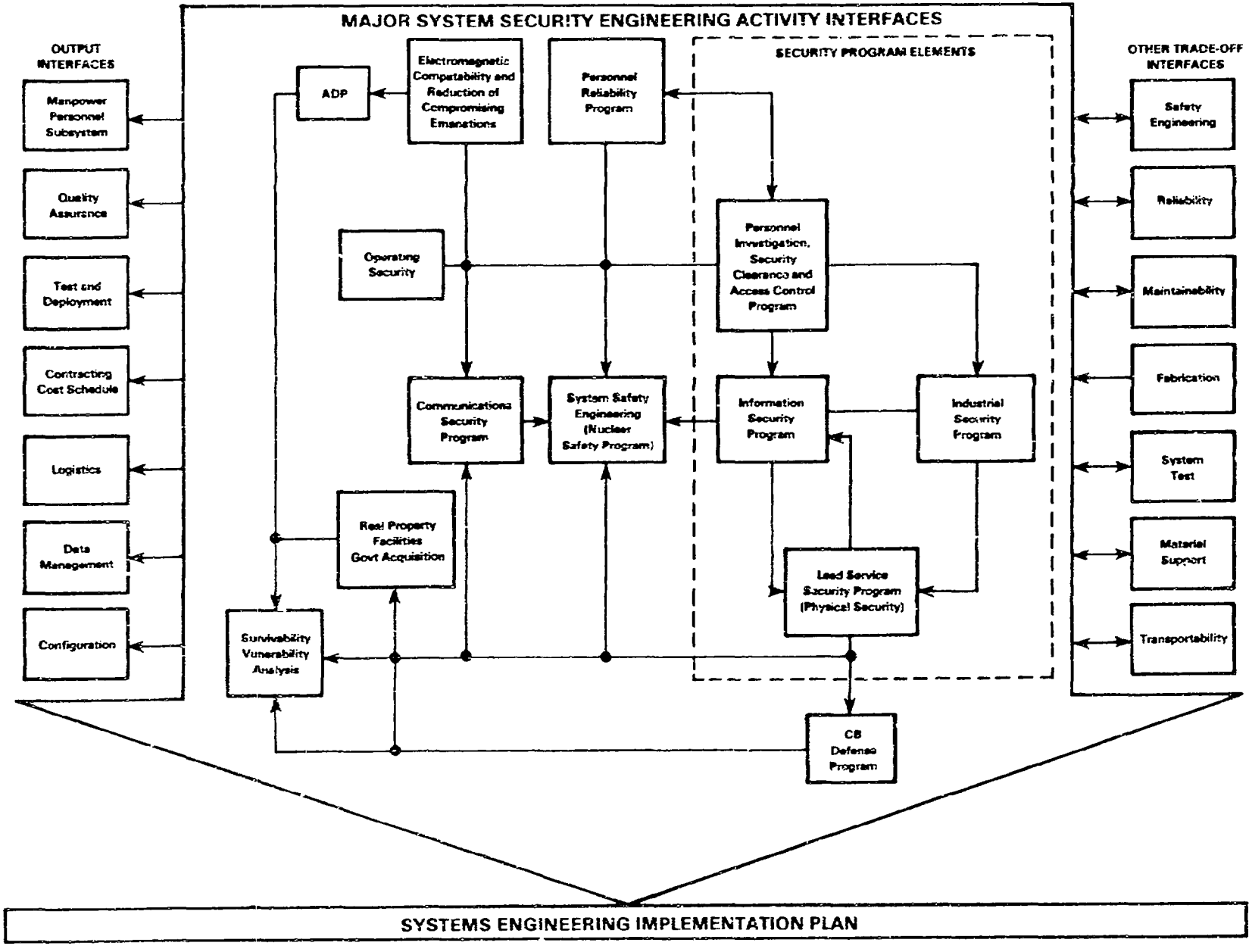


Figure 11-1 System Security Engineering Intraprogram Relationships[13]

• ELSEC. ELSEC and system security operate together to prevent hostile access to, or understanding of, our electromagnetic emissions.

5.0 SUMMARY

• Security covers both classified and unclassified facilities, hardware and software, and also documentation that require protection and special handling procedures.

• The charter of a joint program should include a discussion of the security program, the responsibility for issuance of security guidance, and the identification of the command or office that will provide security assistance to the program as required.

• A security guide should be developed early in the program and should be prepared by an individual in the program office, who is well versed with the overall acquisition.

• The wording of the guide should be as clear and unambiguous as possible to minimize any possible misunderstanding which could lead to the compromise of classified equipment, technology, software or information. Program peculiar phrases and acronyms should only be used when absolutely necessary.

• The security guide should be developed following the steps and procedures prescribed by DoD Handbook 5200.1-H.

• The joint program manager and the technical and administrative staff must be aware of <u>when</u> and <u>why</u> to restrict technical information and to take such actions that will support the policies promulgated in DoD Directive 5230.24.

• A System Security Engineering (SSE) Management Program should be considered for implementation by the joint program manager.

• The procedures of the SSE Management Program define the methods and actions needed to determine system or equipment vulnerability to ground-initiated overt or covert attacks.

• The SSE Management Program establishes life cycle physical security for systems as a condition of applying engineering and design principles and developing required countermeasures and procedures.

• In certain cases, the security program will satisfy system requirements by providing a security response capability; other times, the security program will only be a part of an overall analyses and present alternatives to prevent introducing a security vulnerability into a system's design.

• There are a number of relationships between the SSE Management Program and other security programs that complement or interact with each other such as the Physical Security Program; the Personnel Investigation, Security Clearance, and Access Control Program; the Information Security Program; the Industrial Security Program; plus COMSEC, OPSEC, and ELSEC.

<u>REFERENCES AND FOOTNOTES:</u>

<u>1</u>/ DoD Directive 5200.1, "DoD Information Security Program," June 1982.

<u>2</u>/ DoD Directive 5200.8, "Security of Military Installations and Resources," 29 July 1980.

<u>3</u>/ DoD Directive 5230.24, "Distribution Statement on Technical Documents," November 1984.

<u>4</u>/ DoD Directive 5200.1, "DoD Information Security Program," June 1982, p.2.

<u>5</u>/ DoD 5025.1-I, "DoD Directives System Quarterly Index."

6/ "Program Manager's Notebook," Defense Systems Management College, October 1985, pp. 7.6.a-7.6.d.

7/ DoD 5200.1-H, "Department of Defense Handbook for Writing Security Classification Guidance," March 1986.

8/ DoD Directive 5230.24, "Distribution Statements on Technical Documents," November 1984.

9/ DoD Directive 5230.9, "Clearance of DoD Information for Public Release," April 1982.

10/ DoD Instruction 7930.2, "ADP Software Exchange and Release," December 1979.

11/ DoD Directive 5230.25, "Withholding of Unclassified Technical Data from Public Disclosure," November 1984.

12/ DoD 5200.1-R, "Information Security Program Regulation," August 1982.

13/ AFSCP 207-1, "System Security Engineering Management," 1 June 1982.

CHAPTER 12

RECENT DoD ACQUISITION IMPROVEMENT EFFORTS

1.0 SYNOPSIS

This chapter discusses recent efforts to improve the field of acquisition within the Department of Defense (DoD) including the establishment of the Office of the Under Secretary of Defense (Acquisition) (USD(A)), the President's Blue Ribbon Commission on Defense Management, and various other endeavors. The establishment of the new office of the Under Secretary of Defense for Acquisition (USD(A)) is discussed in section 2.0 including the responsibilities as currently defined in the USD(A) charter. Section 3.0 presents the recommendations of the President's Blue Ribbon Commission. The status of the Defense Acquisition Improvement Program and a description of each initiative is provided in section 4.0, and other related acquisition improvement efforts are cited in section 5.0. Finally, a summary of the chapter is presented in section 6.0.

2.0 ESTABLISHMENT OF THE OFFICE OF UNDER SECRETARY OF DEFENSE (ACQUISITION) (USD(A))

The post of Under Secretary of Defense for Acquisition was created by Congress under the 1986 Military Retirement Reform Act (Public Law 99-348) signed on 1 July 1986. The USD(A) replaced the Under Secretary of Defense for Research and Engineering. OSD has established a new position of Director of Defense Research and Engineering. In addition, Congress added the position of Principal (on the OSD Organizaion Chart) Deputy Under Secretary of Defense for Acquisition, in the Fiscal 1987 Defense Authorization. In September 1986, the new USD(A), Richard Godwin was sworn in. On 10 February 1987, the Deputy Secretary of Defense issued DoD Directive 5134.1[1/] that defined the responsibilities, functions, relationships and authorities assigned to the new USD(A). The directive stated that the USD(A) has the following responsibilities as the principal staff assistant and advisor to the Secretary of Defense for all matters relating to the acquisition processes, as well as research and development; production; logistics; command, control, communications, and intelligence activities related to acquisition; military construction; and procurement. Accordingly, the USD(A) shall:

- Serve as the Defense Acquisition Executive with responsibility for supervising the performance of the entire DoD acquisition system in accordance with the policies, provisions, and authorities contained in DoD Directive 5000.1[2/] and Office of Management and Budget (OMB) Circular No. A-109[3/];

- Develop policy for acquisition plans and strategies, validate program acquisition requirements, and develop acquisition program guidance;

- Set policy for acquisition matters, including contracting, research and development, production, construction, logistics, developmental testing, procurement, and training and career development of acquisition personnel;

- Set policy for administrative oversight of defense contractors;

- Serve as the DoD Procurement Executive, with responsibilities as prescribed in Executive Order 12352[4/] and 41 U.S.C. 401-419[5/];

- The Inspector General, DoD, shall coordinate audit and oversight of contractor activities with the USD(A) to prevent duplication of effort within the

Department and unnecessary duplicative oversight of contractors.

- Serve as the National Armaments Director and Secretary of Defense representative to the Four Power Conference. Develop memoranda of agreements and memoranda of understandings with friendly and allied nations relating to acquisition matters; and

- Chair the Defense Acquisition Board (DAB) assisted by an integrated structure of councils and committees that relate to the acquisition process.

For each assigned area, the USD(A) shall:

- Direct planning and special studies to analyze and evaluate the technical, economic, and military worth of programs in the acquisition system;

- Develop policies, conduct analyses, provide advice, make recommendations, and issue guidance on DoD plans and programs;

- Develop systems and standards for the administration and management of approved DoD acquisition plans and programs;

- Develop plans, programs, actions, and taskings to ensure adherence to DoD policies and national security objectives, and to ensure that programs and systems are designed to accommodate cross-Service operational requirements and promote modernization, consistent with the readiness, sustainability, and efficiency of the Armed Forces of the United States and its allies;

- Review and evaluate recommendations on requirements and priorities;

- Review and evaluate DoD Component plans and programs to ensure adherence to approved policies, standards, and resource planning guidance;

- In conjunction with the Assistant Secretary of Defense (Comptroller) (ASD(C)) and Director of Program Analysis and Evaluation, review proposed resource programs, formulate budget estimates, recommend resource allocations, and monitor the implementation of approved resource programs;

- Fulfill planning, programming, and budgeting activities relating to USD(A) responsibilities;

- Promote coordination, cooperation, and mutual understanding of all matters related to assigned activities, both inside and outside the Department of Defense;

- Serve as primary focal point and principal spokesman for the Department of Defense and serve on boards, committees, and other groups pertaining to assigned functional areas, and represent the Secretary of Defense on USD(A) matters outside the Department of Defense;

- Develop and maintain information management and reporting systems; and

- Perform such other duties as the Secretary of Defense may prescribe.

As indicated above, the USD(A) has broad authority to coordinate and supervise all elements of acquisition in DoD, including serving as the Defense Acquisition Executive, DoD Procurement Executive and the Chairman of the Defense Acquisition Board (DAB). The directive further specifies that the USD(A) will have the authority to direct the Service Secretaries on all matters within the cognizance of the USD(A), such as policy, procedures and the execution of the acquisition system. It should be noted, however, that members of Congress and the USD(A) have ex-

pressed their concern about DoDD 5134.1, particularly with regard to the USD(A) not having more omnipotent authority such as in his relationships with the Secretaries of the Services and their recourse to the Secretary of Defense regarding acquisition matters. The Secretary of Defense has advised the directive will be revised to have Service Secretaries recourse to USD(A). If the matter cannot be resolved, the USD(A) would refer the matter to the Secretary of Defense.

In addition, the structure of the USD(A)'s office is currently being defined. The USD(A) has advised that his office will be organized around four major functional areas:[6/]

- **System Development.** Consisting of two offices - the Director of Defense Research and Engineering (DDR&E) and the Assistant Secretary of Defense for Command, Control Communications, and Intelligence ASD(C^3I). The DDR&E will be in charge of basic research and will serve as the USD(A)'s scientific adviser on development programs. The DDR&E's duties will include technology, exploration/validation, concept definition, engineering development, prototyping, modifications and upgrades, and foreign technology evaluation.[6/]

- **Program Operations.** Consisting of a new office to develop a uniform acquisition information system for the entire DoD acquisition process. The information system is envisioned to maintain track of program status within a thirty (30) day timeframe, as compared to the previous tracking system that provided information that was ninety (90) to one hundred twenty (120) days old.

In addition, the program operations office will be responsible for long-range planning, cost and program analyses, service acquisition program reviews, and acquisition personnel training.[6/]

- **Material Acquisition.** This area will be managed by the Assistant Secretary of Defense for Production and Logistics ASD(P&L), who will advise on production decisions. The ASD will be in charge of procurement, manufacturing/production, contracting policy, industrial base, productivity and quality assurance, and standardization and technical data management.[6/]

- **International.** All international acquisition programs, including technology transfer reviews, are being consolidated into a single office as a unified interface with our allies and friendly nations on acquisition matters.[6/]

Currently, charters delineating the structure and responsibilities of the Defense Acquisition Board (DAB) and its associated committees, are in formal coordination. This is a significant revision since it entailed the consolidation of one hundred twenty six (126) acquisition committees, councils, and panels that serve the DAB into ten (10) committees. The committees will perform pre-reviews for the DAB and coordinate decision documents among the Services and offices within the Office of the Secretary of Defense (OSD).[6/]

As one of the USD(A)'s first efforts to improve the acquisition process, USD(A) issued a Memorandum for the Secretaries of the Military Departments and the Director of Defense Logistics Agency on 11 March 1987 that established a procurement regulatory reform test which could identify ways of simplifying and accelerating the acquisition process. With the memorandum, the USD(A) delegated his authority to issue class deviations to the Federal Acquisition Regulation (FAR) and DoD FAR (DFAR), and waivers of any DoD procurement regulations not required by

statute or executive order, to the service acquisition executives, who could redelegate the authority to the assistant secretary level. The goal of the test is to make it easier and quicker for contracting personnel to get line managers and commanders the quality products and services they need, when they need them. The test effort is to place a strong emphasis on quality and timeliness as well as price to get the best value for the nation, according to the memorandum. In addition, the memorandum stated that the USD(A) desired the addressees to test procurement methods more in line with commercial practices for both commercial and noncommercial products and services. The test is currently underway and preliminary results have not been published.

3.0 PRESIDENT'S BLUE RIBBON COMMISSION ON DEFENSE MANAGEMENT

In July 1985, President Reagan established his Blue Ribbon Commission on Defense Management to "study the issues surrounding defense management and organization, and report its findings and recommendations." In February 1986, the Commission delivered an Interim Report to the President[7/] that provided initial recommendations regarding key aspects of national security planning and budgeting, military organization and command, acquisition organization and procedures, and Government-industry accountability. The Final Report[8/] presented the Commission's complete findings and recommendations in each of the areas cited above. During the same period the Commission was conducting their study, Congress was also conducting hearings regarding the DoD management and organization, that resulted in the enactment of the Goldwater-Nichols Department of Defense Reorganization Act of 1986.[9/] The Act incorporated a number of actions recommended by the Commission's study and the USD(A) has subsequently pursued the recommended actions since being confirmed.

In the area of acquisition organization and procedures, the Commission made the following recommendations:

- The creation by statute of a new position of Under Secretary of Defense (Acquisition) and authorization of an additional Level II appointment in the Office of the Secretary of Defense (OSD). (That is - the USD(A) should be a Level II Presidential appointee with a solid industrial background in the management of complex technical programs.) In addition, the USD(A) should set overall policy for procurement and Research and Development (R&D), supervise the performance of the entire DoD acquisition system, and establish policy for the administrative oversight and auditing of defense contractors.

- The Army, Navy, and Air Force should each establish a comparable senior position filled by a top-level civilian Presidential appointee. The role of the Services' Acquisition Executives would mirror that of the Defense Acquisition Executive. They would appoint Program Executive Officers (PEO), each of whom would be responsible for a reasonable and defined number of acquisition programs. Program Managers for these programs would be responsible directly to their respective PEO and report *only* to him on program matters. Each Service should retain flexibility to shorten this reporting chain even further, as it sees fit. This effort could shorten unambiguous lines of authority that would streamline the acquisition process and cut through bureaucratic layering. By this means, the DoD could substantially reduce the number of acquisition personnel.

- Congress should work with the Administration to recodify all federal

statutes governing procurement into a single government-wide procurement statute. This recodification should aim not only at consolidation, but more importantly, at simplification and consistency.

- DoD must be able to attract, retain, and motivate well qualified acquisition personnel. Significant improvements, along the lines of those recommended in November 1985 by the National Academy of Public Administration, should be made in the senior-level appointment system. The Secretary of Defense should have increased authority to establish flexible personnel management policies necessary to improve defense acquisition. An alternate personnel management system, modeled on the China Lake Laboratory demonstration project, should be established to include senior acquisition personnel and contracting officers as well as scientists and engineers. Federal regulations should establish business-related education and experience criteria for civilian contracting personnel, which will provide a basis for the professionalism of their career paths. Federal law should permit expanded opportunities for the education and training of all civilian acquisition personnel. This is necessary if DoD is to attract and retain the caliber of people necessary for a quality acquisition program.

- The Joint Requirements and Management Board (JRMB) should be co-chaired by the Under Secretary of Defense (Acquisition) and the Vice Chairman of the Joint Chiefs of Staff. The JRMB should play an active and important role in all joint programs and in appropriate Service programs by defining weapons requirements, selecting programs for development, and providing thereby an early trade-off between cost and performance.

- Rather than relying on excessively rigid military specifications, DoD should make much greater use of components, systems, and services available "off the shelf." It should develop new or custom-made items only when it has been established that those readily available are clearly inadequate to meet military requirements.

- A high priority should be given to building and testing prototype systems and subsystems before proceeding with full-scale development. This early phase of R&D should employ extensive informal competition and use streamlined procurement processes. It should demonstrate that the new technology under test can substantially improve military capability, and should as well provide a basis for making realistic cost estimates prior to a full-scale development decision. This increased emphasis on prototyping should allow for the concept "fly and know how much it will cost before the buy."

- The proper use of operational testing is critical to improving the operations performance of new weapons. Accordingly, operational testing should begin early in advanced development and continue through full-scale development, using prototype hardware. The first units that come off the limited-rate production line should be subjected to intensive operational testing and the systems should not enter high-rate production until the results from these tests are evaluated.

- To promote innovation, the role of the Defense Advanced Research Projects Agency should be expanded to include prototyping and other advanced development work on joint programs and in areas not adequately emphasized by the Services.

- Federal law and DoD regulations should provide for substantially in-

creased use of commercial-style competition, relying on inherent market forces instead of governmental intervention. To be truly effective, such competition should emphasize quality and established performance as well as price, particularly for R&D and for professional services.

- DoD should fully institutionalize "baselining" for major weapons systems at the initiation of full-scale engineering development. Establishment of a firm internal agreement or baseline on the requirements, design, production, and cost of weapons systems will enhance program stability.

- DoD and Congress should expand the use of multiyear procurement for high-priority systems. This would lead to greater program stability and lower unit prices.

- DoD must recognize the delicate and necessary balance between the Government's requirement for data and the benefit to the nation that comes from protecting the private sector's proprietary rights. That balance must exist to foster technological innovation and private investment which is so important in developing products vital to our defense. DoD should adopt a data rights policy that reflects the following principles:

  - If a product has been developed with private funds, the government should not demand, as a precondition for buying that product, unlimited data rights even if the government provides the only market. The government should acquire only the data necessary for installation, operation and maintenance.

  - If a product is to be developed with joint private and government funding, the government's needs for data should be defined during contract negotiations. Government contribution to development funding should not automatically guarantee it rights to all data.

  - If a product is developed entirely with government funds, the government owns all the rights to it but may under certain circumstances make those rights available to the private sector.

Finally, the Commission recommended that the President, through the National Security Council, establish a comprehensive and effective national industrial responsiveness policy to support the full spectrum of potential emergencies. Also, that the Secretary of Defense, with advice from the Joint Chiefs of Staff, respond with a general statement of surge and mobilization requirements for basic wartime defense industries, and logistic needs to support those industries and the essential economy. The DoD and Service Acquisition Executives should consider this mobilization guidance in formulating their acquisition policy, and program managers should incorporate industrial surge and mobilization considerations in program execution.

4.0 THE DEFENSE ACQUISITION IMPROVEMENT PROGRAM

The Department of Defense (DoD) implemented the Defense Acquisition Improvement Program (also known as the Carlucci Initiatives) in 1981. Originally, the program consisted of thirty-two (32) management initiatives that addressed long standing problems with major weapon systems acquisition, including significant cost overruns and schedule slippages. In 1983, DoD focused high-level management attention on the initiatives involving:[10/]

- program stability,

- multiyear procurement,

- economic production rates,
- realistic budgeting,
- readiness and support, and
- competition.

Subsequently, in 1984, the DoD added an additional initiative involving ways to enhance the defense industrial base.[10] The initiatives are identified in Table 12-1 along with the status of implementation. The purpose of each initiative is presented below, except for initiative number 1, Principles, and initiative number 23, Implementation, that are embodied in the other initiatives. In addition, several others are consolidated under general headings as will be noted.[11]

- **Preplanned Product Improvement** - to ensure a lower risk approach to weapon system design to reduce unit costs and decrease the time needed to field new equipments.

- **Multiyear Procurement** - to reduce acquisition costs and to improve product quality by stimulating capital equipment investments.

- **Program Stability** - to reduce acquisition costs and time.

- **Capital Investment** - to encourage capital investment by DoD contractors to increase their productivity and lower weapon systems costs.

- **Realistic Budgeting** (including budget to most likely cost, budget for risk, and budget for inflation) - to reduce the cost growth in weapon systems resulting from understated and overly optimistic program and budget estimates, and to enhance program stability.

- **Economic Production Rates** - to reduce the cost and time needed to field a weapon system by producing systems at more economic rates.

- **Contract Type** - to balance program needs and cost savings with a realistic assessment of contractor and Government risk by ensuring the use of the appropriate contract type.

- **Weapon System Readiness and Support** (including support and readiness, test hardware, contractor incentives, visibility of logistics and support, and "Fast Track" programs) - to improve the logistical supportability and maintainability of weapon systems deployed in the field.

- **Administrative Costs/Time** - to reduce the administrative costs and time involved in procuring items by raising the threshold authority for small purchases and eliminating unnecessary paperwork.

- **Government Legislation** - to identify and revise as necessary, acquisition related laws and regulations that are an unnecessary burden on the acquisition process.

- **DoD Directives** - to reduce the number of DoD acquisition directives, the amount of contract documentation, and contract requirements which are not cost effective, thereby reducing program costs.

- **Funding Flexibility** - to provide DoD more funding flexibility by obtaining statutory authority to transfer funds from procurement to R&D for individual weapon system programs without prior approval of Congress or OMB, and increasing reprogramming thresholds for both procurement and R&D programs.

TABLE 12-1 DEFENSE ACQUISITION IMPROVEMENT PROGRAM STATUS [10/] [11/]

INITIATIVES	IMPLEMENTATION	
	FULL	PARTIAL
1. Principles		●
2. Preplanned improvements		●
3. Multiyear procurement	●	
4. Program stability		●
5. Capital investment		●
6. Budget to most likely cost		●
7. Economic production rates		●
8. Contract type	●	
9. Support and readiness		●
10. Administrative costs/time		●
11. Budget for risk		●
12. Test hardware		●
13. Government legislation		●
14. DOD directives		●
15. Funding flexibility	●	
16. Contractor incentives		●
17. Briefing and data requirements	●	
18. Budget for inflation		●
19. Forecast business base		●
20. Source selection		●
21. Standard systems		●
22. Design to cost		●
23. Implementation		●
24. Reduce milestones	●	
25. Link acquisition/budgeting	●	
26. Acquisition council	●	
27. Defense Acquisition Executive	●	
28. Thresholds for milestone reviews	●	
29. Integrate acquisition/budgeting	●	
30. Visibility of logistics/support		●
31. "Fast Track" programs		●
32. Competition		●
33. Defense industrial base		●

• **Acquisition Decisionmaking Process** (including briefing and data requirements, reducing milestones, and thresholds for milestone review) - to decentralize acquisition decisionmaking, and thereby reduce the administrative time and costs associated with major decision points in the acquisition process for major weapon systems.

• **Forecast Business Base** - to develop and maintain a data base covering business base conditions at major defense plants for use in planning acquisition strategy and developing realistic cost estimates.

• **Source Selection** - to improve the source selection process by placing added emphasis on the contractor's past performance, schedule realism, facilities planning, and cost credibility.

• **Standard Systems** - to develop and use standard operational and support systems to achieve earlier deployment and better support of weapon systems.

• **Design to Cost** - to better control weapon systems costs by providing contractual incentives to industry that more closely associate Design to Cost (DTC) goals with actual costs.

• **Linking and Integrating Acquisition and Budgeting** - to help ensure that proposed new program starts are affordable within DoD's planning, programming and budget constraints; and that acquisition decisionmaking milestone reviews consider whether sufficient resources have been committed to carry out the program.

• **Acquisition Council** - to give the Services a greater and more active role in the major systems acquisition process.

• **Defense Acquisition Executive** - to clearly designate the principal advisor to the Secretary of Defense for defense acquisitions, now the USD(A).

• **Competition** - to increase the use of competition in the acquisition process to reduce costs, improve contractor performance, and enhance the industrial base.

• **Defense Industrial Base** - to enhance the industrial base resonsiveness to DoD's needs.

Efforts are continuing to fully implement all of initiatives by the USD(A), the Assistant Secretary of Defense for Acquisition and Logistics, and the Service Secretaries and their acquisition executives.

5.0 RELATED ACQUISITION IMPROVEMENT EFFORTS

Additional efforts to improve the acquisition process for major weapon systems also relate to the recommendations of the President's Blue Ribbon Commission presented in section 3.0 and the Defense Acquisition Improvement Program initiatives cited in section 4.0 and are provided below:

• The ASD (A&L) is working on a five point agenda that includes all three sectors of the defense acquisition community, DoD personnel, Congress and industry according to the following priority:[12]

1. To enhance the defense industrial base,

2. To improve the quality of defense systems,

3. To improve the professionalism of the DoD acquisition workforce,

4. To overcome the adversarial relationship with industry, and

5. To streamline the legislative and regulatory constraints on the acquisition process.

- The Deputy Secretary of Defense issued two directives designed to establish uniform training, education and experience requirements for both military and civilian procurement personnel, DoD Directive 5000.48 and DoD Directive 5000.23.[13/14/]

- Section 1622 of Title 10, U.S. Code states that before being assigned to duty as a Program Manager, a person: (1) must have attended the Program Management Course at the Defense Systems Management College (DSMC) or a comparable program management course at another institution; and (2) must have at least eight years experience in the acquisition, support, and maintenance of weapon systems, at least two of which were performed while assigned to a procurement command.

- USD(A) is restructuring the acquisition decisionmaking milestones to include two new milestones, and is also enhancing milestone 0, New Start, to improve the validation of the mission need and associated system requirements and the establishment of a baseline plan. Milestones I through III will remain essentially unchanged. A new Milestone IV regarding the readiness and support phase, and a new Milestone V concerning the operational phase will be added. Milestone V would address program modifications and provide the basis for new start decisions.[15/]

6.0 SUMMARY

- The USD(A) position was created by Congress in 1986 to function as the principal staff assistant and advisor to the Secretary of Defense for all matters relating to the DoD acquisition system; R&D; production, logistics, and C^3I activities related to acquisition; military construction; and procurement.

- The office of the USD(A) is being organized around four functional areas: System Development; Program Operation; Material Acquisition; and International Acquisition Programs.

- Charters defining the structure and responsibilities of the DAB and its ten (10) associated committees are currently in formal coordination. The committees will perform pre-reviews for the DAB and coordinate decision documents among the Services and offices within the Office of the Secretary of Defense.

- The USD(A) has established a procurement regulatory reform test to identify ways of simplifying and accelerating the acquisition process.

- The President's Blue Ribbon Commission on Defense Management completed their year long study and submitted the results and recommendations in a report to the President in June 1986. The report included recommendations regarding key aspects of national security planning and budgeting, military organization and command, acquisition organization and procedures, and Government-industry accountability. During the same period, Congress was also conducting hearings on DoD management and organization that resulted in the Goldwater-Nichols DoD Reorganization Act of 1986.

- DoD has been pursuing the Defense Acquisition Improvement Program since 1981 to inprove the acquisition process. Of the thirty-three (33) initiatives identified in the program, DoD has fully implemented ten (10) and is in various stages of implementation in the other twenty-three (23).

- The ASD (A&L) is working on a five point agenda that includes all three

sectors of the defense acquisition community, DoD personnel, Congress, and industry.

- The Deputy Secretary of Defense has issued two directives designed to establish uniform training, education, and experience requirements for both military and civilian procurement personnel.

- The USD(A) is restructuring the acquisition decisionmaking milestones by enhancing Milestone 0 and adding Milestones IV and V to cover readiness and support, and operations respectively.

REFERENCES AND FOOTNOTES:

1/ DoD Directive 5134.1, "Under Secretary of Defense (Acquisition)," 10 February 1987.

2/ DoD Directive 5000.1, "Major System Acquisitions," 12 March 1986.

3/ Office of Management and Budget Circular No. A-109, "Major System Acquisitions," 5 April 1976.

4/ Executive Order 12352, "Federal Procurement Reforms," 17 March 1982.

5/ Title 41, United States Code, Sections 401-419, "The Office of Federal Procurement Policy Act," as amended.

6/ "Defense Acquisition Organization," Federal Contracts Report, Vol. 47, No. 10, The Bureau of National Affairs, Inc., Washington, D.C., 9 March 1987, p. 378.

7/ "A Formula for Action - A Report to the President on Defense Acquisition," the President's Blue Ribbon Commission on Defense Management, April 1986.

8/ "A Quest for Excellence - Final Report to the President," the President's Blue Ribbon Commission on Defense Management, June 1986.

9/ "Goldwater-Nichols Department of Defense Reorganization Act of 1986," Public Law 99-433 of 1 October 1986.

10/ "DoD's Defense Acquisition Improvement Program: A Status Report, GAO/NSIAD-86-148, General Accounting Office, July 1986, p.1.

11/ "Status of the Defense Acquisition Improvement Program's 33 Initiatives," GAO/NSIAD-86-178BR, General Accounting Office, September 1986, pp. 2-3.

12/ "DoD Nominees' Five-Point Agenda Includes Acquisition Workforce, Congress, Industry," Federal Contracts Report, Vol. 46, No. 23, The Bureau of National Affairs, Inc., Washington, D.C., 12 December 1986, p. 1001.

13/ DoD Directive 5000.48, "Experience, Education and Training Requirements for Personnel Assigned to Acquisition," 9 December 1986.

14/ DoD Directive 5000.23, "System Acquisition Management Careers," 9 December 1986.

15/ "Two New Milestones," Federal Contracts Report, Vol. 47, No. 10, The Bureau of National Affairs, Inc., Washington, D.C., 9 March 1987, p. 378.

CHAPTER 13

LESSONS LEARNED AND SUCCESSFUL PROGRAMS

1.0 SYNOPSIS

This chapter discusses a number of lessons learned as a result of managing joint programs, some successful and others not so successful. By reviewing lessons learned, Joint Program Office personnel should benefit in their management by applying the knowledge of recommended approaches and actions to their program. Section 2.0 provides a general discussion regarding joint programs and lessons learned. Next, section 3.0 presents general considerations based on actual joint program experience. Prime examples of successful programs are identified and several are discussed regarding the reasons they were successful in section 4.0. A summary of the chapter is provided in section 5.0.

2.0 DISCUSSION

Since practically every joint program will have certain peculiarities, not every joint program will encounter or experience the same problemmatic situations. However, similar situations may occur which if recognized, anticipated or planned for, could benefit an ongoing program.

Joint Programs require considerably more planning, coordinating and time consuming effort to accomplish, then do single-service programs. As Rear Admiral Freeman, then Commandant of DSMC, stated in 1979, and which is still applicable today:[1/]

> ". . . the word joint does not necessarily mean togetherness. Most programs are the result of forced marriages . . . Clearly joint programs require the very finest in management skills, particularly from the Program Manager . . ."

When a joint acquisition program is decided on, the lead service usually appoints the Program Manager (PM) and the PM's organization and conduct of the acquisition is normally governed by a charter that usually emphasizes the management philosophy of the lead service. The charter though coordinated with the participating services, may subsequently become an item of issue as the program is implemented. Personnel participating in a joint program have divided loyalties, to the joint program and their service affiliation. The strengths of the loyalties can depend on numerous factors, from their sense of responsibility and concern to protect their service's interests, to consideration of future ramifications on promotions and reassignments that may result from their joint program tour of duty.[2/]

Likewise, numerous other interreactions between the joint program office and the involved Services, both leading and participating, can cause impacts, such as priority changes of service programs and related funding, program emphasis and interest within the Service, degree of involvement in the joint program, or changes in performance requirements or threat. Further, in many instances, these impacts do not occur at appropriate times in the acquisition process.[3/]

As stated previously in this guide, as well as in a number of other sources, including the Defense Science Board Study of 1983,[4/] the objective of a Joint Program is to:

- Increase military effectiveness, and
- Achieve efficiencies and economies, if possible.
- Plus, exploit technology while considering a balance between technology and requirements.

The last objective is especially difficult, first in determining the extent to which the technology state-of-the-art should be projected for a given proposed system that will be acceptable to all Services involved in the joint acquisition, and second, the most difficult, the joint agreement of the involved Services on the mission need and doctrinal requirements.[5/]

Service positions on system features can become critical problem areas in developing the requirements for a joint system. Negotiations to resolve differences have continued from several months up to years in the past. In certain joint acquisition efforts, involved Services have presented long lists of requirements, some of which could be used as "bargaining chips" rather than actual necessities. Other requirement items were essential enviromental factors or critical integration considerations with existing systems. In addition, agreement among the Services on the priority of their listed requirements were even more difficult to achieve.[7/]

Sometimes certain requirments may inadvertently be omitted at the start or evolve as the joint development of requirements progresses, and consequently impact on the acquisition plans, schedules and cost. Likewise, when requirements have been developed through negotiation and compromise, the end product may not achieve the performance ojbectives anticipated by some of the involved Services. In some instances, this has resulted in the development of variations of the end product or the withdrawal of a Service from a joint program.

Joint systems, as single-service ones, can take eight (8) to fifteen (15) years to achieve deployment. During the 1970s and early 1980s, many joint programs were often established well into the acquisition process, sometimes beyond engineering development, when the lead service design had been well formulated. Accordingly, there was considerable reluctance to modify or compromise the design to satisfy the needs identified by the participating service or services.[6/] Some "out-of-step" joint programs still exist, however, as more emphasis is placed on the jointness of system acquisitions before the Concept Exploration Phase by the Joint Chiefs of Staff (JCS) and the Under Secretary of Defense for Acquisition (USD(A)), a more harmonious environment for Joint Program Managers (PMs) and their staffs, and their interfaces with both lead and participating services should occur.

A principal lesson learned from the "out-of-step" joint programs is that the programs have a great propensity for reverting to single-service programs.

3.0 LESSONS LEARNED

Lessons learned in both successful and not so successful joint programs can benefit current and future Program Managers and their staffs. As mentioned in section 2.0 above, each joint program is an entity unto itself, however, simlar circumstances and actions necessitated by the acquisition process will occur, and with them possible problemmatic situations. By being alerted to such situations through lessons learned, pitfalls may be eliminated or at least the severity reduced.

Lessons learned based on actual joint program experience are presented below:[8/]

- The earlier in concept formulation/development that a joint charter can be established, the greater the probability of program success and ultimate commonality.

- The need for strong, flexible leadership cannot be overemphasized.

- The establishment of equitable management and engineering procedures is critical to the ultimate success of any joint program.

- Understand that allowances must be made for differences in procedures and approaches among the Services.

- Joint programs produce additional and continuing interest among higher authorities in each involved Service as well as DoD and Congress, that will necessitate requirements for additional briefings and communications.

- The structure of the joint program office (see Table 1-1 and Figure 6-1) as well as the emphasis placed upon the program by DoD, the Services and Congress, will have a decided effect on the management and success of the program. The increased interest in the acquisition field, including joint programs, by Congress and DoD during recent years was illustrated by General Skantze in his remarks at the DSMC PMC Class 86-1 convocation:[9/]

"On Capitol Hill 10 years ago, four committees and subcommittees wrote defense legislation. Last year, by one count, 64 had at it. In 1983, DoD witnesses gave 1,453 hours of testimony, and responded to 84,148 written inquiries and 592,150 telephone requests. Last year the Congress changed 1,800 separate programs. There's been an explosion of mandated DoD reports and studies; from 36 in 1970 to 458 in 1985. That's a 1,272 percent increase. How does that affect you? Program office people provided the lion's share of the data for those reports and testimonies."

- Logistics is one of the most difficult areas in joint program efforts. Unlike many other interservice issues that can be resolved by escalation to higher decision authority, logistic problems must be settled at the working level by specialists through an effective manager and coordinator.[10/]

- A program's success is not determined by the technological state-of-the-art, but rather by the associated risks, and these risks must be adequately funded to avoid cost overruns.[11/]

- Work with Services to baseline all joint programs no later than the beginning of Full Scale Development Phase.[12/]

- To the maximum extent possible, ensure the accuracy of the data and information used in the program's management, and also ensure that the same accurate data and information is provided to Congress, DoD and the Services.[13/]

4.0 SUCCESSFUL JOINT PROGRAMS

Of all the joint programs in recent years including those cited in Appendix F, certain ones have been recognized by DoD and the Services as prime examples of successful major programs:

- Advanced Medium Range Air-to-Air Missile (AMRAAM),

- Defense Satellite Communications System (DSCS),

- F-4 Aircraft,

- Hellfire Missile,

- High Speed Antiradiation Missile (HARM),

- Integrated Electronic Warfare System (INEWS),

- Joint Cruise Missile,

- NAVSTAR GPS,

- Sidewinder Missile,

- V-22 (OSPREY) Joint Vertical Lift Aircraft.

The prime reasons cited for the success of the AMRAAM, the DSCS, and to a degree, the F-4 Aircraft programs were the resolution of requirement issues at the onset of the joint programs, and the front-end planning and settlement of as many technical and management issues as possible. Issues to be resolved should at least include the following:[14]

- Operational concepts,
- Performance specifications (including operability and supportability),
- Technical approaches and options,
- Configuration constraints,
- Acquisition strategy,
- Cost and schedule,
- Relative worth vis-a-vis current and alternative systems,
- Management structure.

The Hellfire missile was designed from the onset to meet common performance requirements of the Army, Navy and Marine Corps. There was one difference between the AGM-114A Hellfire (Army) and the AGM-114B Hellfire (Navy). To meet Navy shipboard safety requirements, the AGM-114B model was designed to have a mechanical Safety Arming Device (SAD) to prevent accidental firing of the rocket motor by the electromagnetic fields encountered in shipboard environments. In addition, the Navy Operational Evaluation (OPEVAL) testing went smoothly subsequent to the Army solving inherent technical and performance problems enccuntered during extensive testing program by the Army. The total Navy test program was completed in a cost-effective manner using Army test data, that allowed for cost savings in time and money compared to a stand-alone Navy program. In addition, competition in production was introduced into the program by requiring two corporations, each of which had about sixty-five (65) percent of the knowledge required to build the complete missile, to share technical data packages through a technology transfer program and bid to build the complete missile. Further, the two prime contractors compete yearly to determine the quantity split. This method allows the low bidder to receive up to seventy-five (75) percent of the total contract award. This combined effect of a dual-source procurement strategy and the competitive bidding process has significantly reduced the missile's flyaway unit cost from $43,500 per unit in FY1984 to $27,800 per unit in FY1986. The competition benefitted both Services and the Marine Corps by combining requirements and procuring larger quantities that resulted in economies of scale in unit costs.[15]

5.0 SUMMARY

- Program Managers and their staffs can benefit from lessons learned in similar situations.
- Joint programs require considerably more planning, coordinating and time consuming effort to accomplish, then do single-service programs.
- Personnel participating in joint programs have divided loyalties - to the joint program and to their service affiliations.
- Differences in which the Services view the joint program, such as involvement, priority or funding, can impact on the joint program.
- Obtaining a joint agreement on the mission need and doctrinal requirements

is one of the most difficult tasks in a joint program effort.

- Agreement by the Services on the priority of their listed requirements is one of the most difficult to achieve.

- Staggered entry of the Services into an acquisition program can impact severely on a program and endanger its probability for success.

- Regarding lessons learned, the following should be considered:

  - Establish a joint charter as soon as possible.

  - Provide strong and flexible leadership.

  - Establish equitable management and engineering procedures.

  - Make allowances for the differences in Services' procedures and approaches.

  - Plan for additional high level briefings and communications.

  - The structure of the joint program office will have a decided effect on the management and success of the program.

  - Special attention should be given to logistics as it is one of the most difficult areas in joint program efforts.

  - Consider the associated risks related to the planned technological state-of-the-art of the system being acquired.

  - Establish a system baseline before the start of the Full Scale Development (FSD) phase.

  - Use and provide the same accurate data and information, both internally and externally to the program.

REFERENCES AND FOOTNOTES:

1/ RADM Rowland G. Freeman, III, USN, "Foreword," Defense Systems Management Review, Spring 1979, DSMC, p.5.

2/ "Joint Major System Acquisition by the Military Services: An Elusive Strategy," GAO/NSIAD-84-22, General Accounting Office, 23 December 1983, p. 25.

3/ "Defense Organization: The Need for Change," Staff Report to the Committee on Armed Services, U.S. Senate, 99th Congress, 1st Session, Government Printing Office, 16 October 1985, pp. 548-552.

4/ "Joint Service Acquisition Programs," Defense Science Board, OUSDRE, 1983 Summer Study, February 1984, p. 16. (ADA 141-417)

5/ "Joint Major System Acquisition by the Military Services: An Elusive Strategy," p. 12.

6/ "Joint Major System Acquisition by the Military Services: An Elusive Strategy," p. 13.

7/ Cols. N.A. McDaniel and D. A. Lorenzini, USAF, "An Analysis of Joint Service Programs," Center of Advanced Research, Naval War College, June 1979, p. 46.

8/ Capt. J. D. Miceli, USN, "Army/Navy Guided Projectiles: A Joint Program that Works," Defense Systems Management Review, Volume 2, Number 2, DSMC, Spring 1979, pp. 48-49.

9/ General Lawrence A. Skantze, USAF, "Managing Defense Programs," Program Manager, DSMC, November-December 1986, p. 18. (Based on General Skantze's remarks at the DSMC PMC Class 86-1 convocation.)

10/ John S. W. Fargher, Jr., "Joint Services Integrated Logistics Support," Proceedings, Seventeenth Annual International Logistics Symposium, Society of Logistics Engineers, Boston, MA, August 24-26, 1982.

11/ J. Stanley, et al, "Successful Programs: Can We Learn from Their Experience?" Program Manager, DSMC, January-February 1984, p. 35.

12/ "Joint Program Study - Final Report - Volume I," Joint Service Acquisition Program Management Study, Ad Hoc Group, 24 July 1984, p. 6-5. (ADA 154-910)

13/ Wilbur D. Jones, Jr., "Reflections of a Department of Defense Program Manager," Program Manager, DSMC, January-February 1986, p. 36.

14/ "Joint Service Acquisition Programs," pp. 15-16.

15/ Ernest J. Kish, "Hellfire - A Joint Service Success Story," Program Manager, DSMC, March-April 1987, pp. 9-11.

APPENDIX A

MEMORANDUM OF AGREEMENT ON THE MANAGEMENT OF MULTISERVICE SYSTEMS/PROGRAMS/PROJECTS[1]

1. Purpose:

This Memorandum establishes policies for implementing multiservice systems, program/project management in accordance with DoD Directive 5000.1, "Acquisition of Major Defense Systems," 13 July 1971. It is the basic policy document for management of multiservice systems, programs and projects, and the framework within which, like DoD Directive 5000.1, acquisition management procedures must operate.

2. Policy:

The Service designated as the Executive Agent shall have the authority to manage the program/project under the policies and procedures used by that Service. The Program/Project Manager, the Program/Project Management Office, and, in turn, the functional elements of each Participating Service will operate under the policies, procedures, data, standards, specifications, criteria and financial accounting of the Executive Service. Exceptions, as a general rule, will be limited to those where prior mutual agreement exists or those essential to satisfy the substantive needs of the Participating Services. This may require the Participating Services to accept certain deviations from their policies and procedures so as to accommodate the assumption of full program/project responsibility by the Executive Service. Demands for formal reporting as well as non-recurring needs for information will be kept to a minimum.

3. Responsibilities:

a. The Executive Service will:

(1) Assign the Program/Project Manager.

(2) Establish an official manning document for the Program/Project Management Office which will incorporate the positions to be occupied by representatives of the Participating Services, e.g., Department of the Army Table of Distribution and Allowances (TDA)/Department of the Navy Manpower Listing/Department of the Air Force Unit Detail Listing (UDL). The manning document developed from the Joint Operating Procedure on Staffing will also designate a key position for occupancy by the Senior Representative from each of the Participating Services.

(3) Staff the Program/Project Management Office with the exception of the positions identified on the manning document for occupancy by personnel to be provided by the Participating Services. Integrate the Participating Service personnel into the Program/Project Management Office.

(4) Be responsible for the administrative support of the Program/Project Management Office.

(5) Delineate functional tasks to be accomplished by all participants.

b. The Participating Services will:

(1) Assign personnel to the Program/Project Management Office to fill identified positions on the manning document and to assist the Program/Project Manager in satisfying the requirements of all participants. Numbers, qualifications and specific duty assignments of personnel to be initially provided by each Participating Service will be reflected in the Joint Operating Procedure.

(2) The Senior Representative from each Participating Service will be

reflected in the Joint Operating Procedure.

(2) The Senior Representative from each Participating Service will be assigned to a key position in the Program/Project Management Office and report directly to, or have direct access to, the Program/Project Manager. This key position could include assignment as Deputy to Program/Project Manager. He will function as his Service's representative, with responsibilities and authorities as outlined in Paragraph 3.d of this Agreement.

(3) Provide travel funds and support necessary for the accomplishment of the responsibilities of their representatives in the management of the Program/Project.

(4) Accomplish Program/Project functional tasks as specifically assigned in the Charter, in the Master Plan and Joint Operating Procedures (JOPs), or as requested and accepted during the course of the Program/Project.

c. The Program/Project Manager will:

(1) Satisfy the specific operational, support and status reporting requirements of all Participating Services.

(2) Be responsible for planning, controlling, coordinating, organizing and directing the validation, development, production, procurement and financial management of the Program/Project.

(3) Review, on a continuing basis, the adequacy of resources assigned.

(4) Assure that planning is accomplished by the organizations responsible for the complementary functions of logistics support, personnel training, operational testing, military construction and other facilities, activation or deployment.

(5) Refer to the appropriate authority those matters that require decisions by higher echelons. The following items will be referred to appropriate authority:

(a) Deviations from the established Executive Service policy except as specifically authorized by the Program/Project documentation (reference Paragraph 4 below).

(b) Increases in funding of the Program/Project.

(c) Changes to milestones established by higher authority.

(d) Program/Project changes degrading mission performance or altering operational characteristics.

d. Participating Service Senior Representative(s) within the Program/Project Management Office will:

(1) Speak for his parent Service in all matters subject to the limitations prescribed by his Service. Authority of the Service Senior Representative is subject to the same limitations listed above for the Program/Project Manager.

(2) Refer to his parent Service those matters which require decisions by higher echelons.

4. Documentation:

Management for particular Multiservice Program/Projects shall be documented by:

(a) A Multiservice Program/Project Manager Charter. The responsible Commander in the Service having principal Program/Project management responsibility will cause the preparation,

negotiation and issuance of a jointly approved Charter which will identify the Program/Project Manager and establish his management office. The Charter will define his mission responsiibility, authority and major functions, and describe his relationships with other organizations which will use and/or support the Program/Project. The Charter will describe and assign responsibility for satisfying peculiar management requirements of Participating Services which are to be met in the Program/Project and will be jointly approved for the Headquarters of each involved Service by persons officially appointed to approve such Charters.

(b) A Program/Project Master Plan. This is the document developed and issued by the Program/Project Manager which shows the integrated time-phased tasks and resources required to accomplish the tasks specified in the approved statement of need/performance requirements. The plan will be jointly approved for each involved Service by persons officially appointed to approve such plans.

(c) Joint Operating Procedures (JOPs). These will identify and describe detailed procedures and interactions necessary to carry out significant aspects of the Program/Project. Subjects for JOPs may include Systems Engineering, Personnel Staffing, Reliability, Survivability, Vulnerability, Maintainability, Production, Management Controls and Reporting (including SAR), Financial Control, Test and Evaluation, Training, Logistics Support, Procurement and Deployment. The JOPs will be developed and negotiated by the Program/Project Manager and the Senior Representatives from the Participating Services. An optional format is suggested in Attachment 1 to this Agreement. This action will be initiated as soon as possible and accomplished not later than 180 days after promulgation of the Multiservice Program/Project Manager Charter. Unresolved issues will be reported to the Charter approving authorities for resolution.

d. Coordination/Communication. Where Participating Services are affected, significant program action, contractual or otherwise, will not be taken by the Program/Project Manager without full consultation and coordination with the Participating Services while the matter is still in the planning stage. All formal communications from the Program/Project Management Office to higher authority in the Executive or Participating Services will be signed by the Program/Project Manager or his designated representative. Substantive change to the Charter, Master Plan, or JOPs will be negotiated with affected Participating Services prior to issuance as an approved change. No restrictions will be placed on direct two-way communications required for the prosecution of the Program/Project work effort, other than that required for security purposes.

1 Atch
JOP Format

We approve this Memorandum of Agreement and its implementing regulation.

/s/HENRY A. MILEY, JR.
General, USA
Commanding General
US Army Materiel Command

/s/I.C. KIDD, JR.
Admiral, USN
Chief of Naval Material
Naval Material Command

/s/JACK J. CATTON
General, USAF
Commander

Air Force Logistics Command

/s/GEORGE S. BROWN
General, USAF
Commander
Air Force Systems Command

20 July 1973

Joint AMC/NMC/AFLC/AFSC Operating Procedure format.

I. INTRODUCTION:

This paragraph is intended to give a description and a brief review of the functional area of interest including why the JOP is necessary. Outline briefly the overall requirement which needs fulfillment.

II. SCOPE

The scope will outline the various phases of the Program/Project and tie down the overall limits of the functional area of interest in terms of time and any special provisions or limitations.

III. REFERENCES:

Include all applicable AMC/NMC/AFLC/AFSC regulations, directives, etc., that are pertinent to the functional area of interest.

IV. RESPONSIBILITIES:

This paragraph is intended to identify the relationships and responsible entities such as who has the overall management responsibility and who has the support responsibility. In addition, this paragraph should describe what the "product" or the effort should be.

V. PROCEDURES:

This paragraph should define the work to be accomplished and indicate the main steps of action, including coordination, which are required to conduct the tasks involved properly in developing the functional area of interest.

APPROVAL:

Senior Representative
Participating Service

Program/Project Manager
Executive Service

Attachment 1

FOOTNOTE:

1. This memorandum of agreement is published as a joint regulation, AFLC/AFSC R 800-2.AMCR 70-59/NAVMATINST 5000.10A.

APPENDIX B

CHARTER FOR THE JOINT SERVICES ADVANCED VERTICAL LIFT AIRCRAFT V-22 OSPREY PROGRAM MANAGER (PMA 275)[1]

Ref: (a) *DEPSECDEF memo of 30 Dec 81, Rotary Wing Aircraft Development*
(b) *MOU on the Joint Services Advanced Vertical Lift Aircraft Development Program of 4 Jun 82*
(c) *DESPSECDEF memo of 8 Dec 82, Joint Services Advanced Vertical Lift Aircraft*
(d) *USD memo of 27 Dec 82, Joint Services Advanced Vertical Lift Aircraft*
(e) *Program Budget Decision 241*
(f) *DOD Directive 5000.1 of 29 Mar 82*
(g) *DOD Instruction 5000.2 of 8 Mar 83*
(h) *AFSCR/AFLCR 800-2/AMCR 70-59/NAVMATINST 5000.10A, Management of Multiservice Systems, Programs, and Projects*
(i) *V-22 Osprey Joint Service Operational Requirement*
(j) *MOA for V-22 Osprey of 19 May 83*
(k) *Air Force Special Order G-41 of 26 May 83*
(l) *NAVAIRINST 5400.1B, Naval Air Systems Command Headquarters Organizational Manual*
(m) *NAVAIRINST 5000.8A, Systems Acquisition Management in the Naval Air Systems Command*
(n) *NAVAIRINST 5400.108, Program/Functional Matrix Management within the Naval Air Systems Command*
(o) *NAVAIRINST 5451.87 w/CH-1*
(p) *SECNAVINST 5000.1B, System Acquisition*
(q) *NAVAIRINST 1611.1G, Submission of Fitness Reports*
(r) *AR 700-129/OPNAVINST 4105.2/AFR 800-43/MCO 11310.86, Management and Execution of Integrated Logistic Support (ILS) Programs for Multiservice Acquisitions*

1. Introduction.

This charter provides the mission, authority, and responsibility of the Joint Services Advanced Vertical Lift Aircraft V-22 Osprey Program Manager (PM) and outlines the program's scope, operating relationships, organization, and resources.

a. Joint Service Participation. The Deputy Secretary of Defense recognized in reference (a) the need for joint development of a multimission advanced vertical lift aircraft for the 1990's. The Army was designated executive service for the joint development effort with the Navy and Air Force as participating services. Initial development efforts were outlined in references (b) and (c) and were subsequently modified by reference (d), which also changed designation of the executive service to the Navy. Reference (e) reflected the Army's intention only to procure V-22 aircraft configured to meet the Marine Corps mission. Preparation, development, and major revisions of all key program documents relating to system specifications, air-worthiness qualification, test and evaluation, program/acquisition plans and strategy, and logistics supportability will include multiservice representation.

b. References. This program will be conducted according to management principles identified in references (f), (g), and (h).

2. System Description.

The V-22 system is under development as a vertical lift aircraft using advanced, but mature, technology that will provide the Navy, Air Force, and Marine Corps with a self-deployable, multimission vertical/short take-off and landing capability for the 1990's and beyond.

3. Mission.

The PM's primary mission is to provide the Department of Defense (DoD) operating forces with a fully developed, supportable, and reliable advanced vertical lift aircraft weapon system capable of satisfying operational requirements, including, but not limited to, the following: Marine Corps assault vertical lift; Navy combat search and rescue; and Air Force special operations. Specific mission requirements are defined in reference (i). In addition, the PM will manage the acquisition and support of similar systems for foreign governments when required in support of Defense Security Assistance Programs (DSAPs).

4. Scope of the Program.

a. The scope of the V-22 Program consists of the definition, development, test and evaluation, acquisition, initial support, and readiness improvement of the weapon system. This includes subsystems and components, spares, repair parts, peculiar and common support equipment, weapon system trainers/flight simulators, air maintenance trainers, and all supporting technical documentation. Initial procurement will be for DoD components with potential procurement for foreign governments.

b. Funds listed in the Five Year Defense Program and assigned to the PM for obligation in executing program objectives are included in the following research, development, test, and evaluation program elements: Navy 63256/64262N.

(1) When required, participating services' funds for common weapon system development will be identified on military interdepartmental purchase rquests prepared by the cognizant service.

(2) Additional program element funds to be controlled by the PM may be identified.

5. Program Staffing and Organization.

The V-22 Program will be planned, organized, and controlled by the PM through a designated joint service program office. Located at the Naval Air Systems Command Headquarters (NAVAIR), this program office will respond to the requirements of the executive and participating services and will be the single point of contact for all official actions within the services and with industry during all phases of the program.

a. In keeping with the requirements outlined in references (h) and (j), the PM will coordinate with the Aeronautical Systems Division (ASD) to establish and maintain a joint staffing document for the joint program office, incorporating positions to be occupied by representatives from each service. The initial program office organization and staffing requirements are shown in appendix A. The individual responsible for program financial matters is:

Financial Execution Officer:
Michele P. Kenlon

b. The program office will be administratively supported by NAVAIR. This support will include, but not be limited to, military personnel services, space allocations, office services, security, graphic arts, and communications. Further, this support will include coordination of civilian personnel services administered by the Consolidated Civilian Personnel Office, Crystal City. Travel support for participating services personnel outside the V-22 Program Office will be provided following respective service procedures.

c. In keeping with reference (k), which authorized establishment of an operating location at the V-22 Joint Program Office in Crystal City, Virginia, effective 1 June 1983, ASD will establish an operating location at NAVAIRHQ and fill the civilian and military positions as agreed to in the joint staffing document. The Deputy for Air Force Air Vehicle, as senior service representative, will be the supervisor of all Air Force military and civilian personnel, as well as chief of the operating location, regardless of where these personnel are physically located. Specific duties and responsibilities of these personnel will be assigned by the PM in consultation with the Deputy for Air Force Air Vehicle.

6. Authorities and Responsibilities.

Colonel J. A. Creech, USMC, is assigned as the PM of the Joint Services Advanced Vertical Lift Aircraft Program (PMA275). He will be assisted by the Deputy for Marine Air Vehicle, the Deputy for Navy Air Vehicle, and the Deputy for Air Force Air Vehicle, all of whom will be located in the Program Office. Further, he will be assisted by the Deputy PM, who will act for him in his absence.

a. General. The PM is the single central executive responsible for successfully managing the program and accomplishing the objectives of this charter. He has broad directive authority within the scope of the program over the planning, organization, direction, control, and use of program resources to meet DoD requirements, and also has authority over program efforts of Navy in-house and contractor organizations, including assignment of responsibility as appropriate to the various NAVAIRHQ functional elements following the overall framework outlined in references (l), (m), (n), and (o). As the responsible executive, he is expected to act on his own initiative in matters affecting the program. In those cases where action is required beyond the authority granted in this charter, he shall refer the action to higher authority in the Department of the Navy with his recommendations, including alternatives available.

b. Specific. The PM is delegated the specific authority in paragraph 11 of enclosure (1) to reference (p) to accomplish the following responsibilities.

(1) Manage the V-22 Program, including establishing a baseline and tracking and coordinating changes to that baseline.

(2) Prepare and sign fitness reports for all Navy and Marine Corps military personnel (of the rank of commander and below) assigned full time to the Program Office, and execute performance evaluations for applicable civilian personnel assigned full time to that office. He may also submit concurrent fitness reports on other officers junior to him and concurrent evaluations on civilian employees from other commands working for him in matrix management under the authority of this charter. In keeping with reference (q) guidance, the PM will prepare a letter of evaluation for the Deputy for Air Force Air Vehicle and submit it to his/her rating official.

(3) Respond to DSAP requirements. When required by the recipient foreign country, the PM will provide overall initiation, guidance, coordination, and review of DoD efforts in logistically supporting and sustaining in-country inventory of weapon systems under his cognizance. The PM will also maintain close liaison with, and maximum responsiveness to, the NAVAIRHQ Defense Security Assistance Division (AIR-103), the Naval Supply Systems Command (SUP-07), and the Office of the Chief of Naval Operations (OPNAV (OP-63)) on DSAP matters.

c. Conflict Resolution. When conflicts between program and functional policies develop, actions directed by the PM will be carried out pending final resolution of such matters. Procedures

for resolving conflict are addressed by reference (j).

d. Deputies for Service Vehicles. The executive service and each participating service will assign a deputy for service vehicle. These deputies will assist the PM in planning, organizing, coordinating, controlling, and directing the definition, development, production, procurement, and financial management of the joint program, and also serve in a staff position in all joint program office matters. As such, each deputy is the primary point of contact between his/her service and the PM, and is directly responsible to the PM for program functions. He/she will ensure that specific service operational and logistics requirements and service positions on program objectives are considered and met in all appropriate elements and functions of the approved joint program. He/she will represent his/her service in matters related to the management and coordination of the day-to-day execution of the approved joint program and in such other matters as may be requested by the PM. He/she will comply with established executive service policies, implementing directives, this charter, and joint operating procedures (JOP's); he/she also will provide input to and review program issues and policies as they impact service interests.

7. Limitation of Authority.

Limitation of the PM's delegated authority are as follows:

a. He does not have the authority to deviate from established policy.

b. Communication, action, or inaction, in any form, which contractors may interpret as direction will be conducted through the appropriately assigned contracting officer.

8. Specific Interface and Operating Relationships.

a. Navy Unique

(1) Relationship to Chartering Authority. The PM receives his authority from and is ultimately responsible and accountable to the Commander, Naval Air Systems Command (COMNAVAIR) for the discharge of the latter's responsibility for management of the V-22 Program. The PM reports directly to the Deputy Commander for Programs (AIR-01), who, with the Director for Anti-Submarine Warfare and Assault Programs (PDA-13), provides policy determination and requirements definition, as well as organizational and administrative support, programming, and life cycle coordination among all assigned programs. Matters requiring COMNAVAIR's attention will first be coordinated with AIR-01 or PDA-13 who will, if possible, accompany the PM to see COMNAVAIR. When neither AIR-01 nor PDA-13 is available and urgency dictates immediate communication with COMNAVAIR, the PM will brief AIR-01 or PDA-13 as soon as they are available.

(2) Tasks. The PM will accomplish the following:

(a) Coordinate appropriate interface segments of the program with other program managers, systems commands, and the Chief of Naval Operations (CNO) staff to ensure a coordinated OPNAV effort, and establish and promulgate design interface specifications to ensure weapon systems integration. Unresolved interface problems will be referred directly to the appropriate senior management official within OPNAV.

(b) Maintain active liaison with cognizant members of the OPNAV staff and with cognizant program coordinators following the Navy Programming Manual. The PM will keep them fully informed of the status and progress of the program through formal and informal communication.

(c) Keep the Commander, Naval Military Personnel Command (COMNAVMILPERSCOM) fully informed of military personnel requirements of the weapon system. This

information normally will be transmitted to COMNAVMILPERSCOM through the cognizant program coordinators in OPNAV.

(d) Review operational requirements, including inventory objectives established by higher authorities for the program, to ensure timeliness, accuracy, consistency, and compatibility with program plans and funding availability. When the PM cannot resolve inconsistent or incompatible requirements and objectives, he will submit the problems and recommendations in writing to COMNAVAIR and other appropriate higher authorities for resolution.

(e) Establish appropriate requirements for, and monitor the acquisition of, special or additional facilities necessary to support test, evaluation, installation, operation, and maintenance of V-22 systems and supporting devices. He will ensure that facilities planning factor criteria are developed with Naval Facilities Engineering Command Headquarters (Code 2013) representatives and published in NAVFAC P-80; and he will further ensure that requirements for new facilities, and modifications to existing facilities, are made known to participating organizations so that planning, programming, and construction schedules will be responsive to support V-22 systems.

(f) Maintain liaison with cognizant personnel at NAVAIR test and evaluation activities during the developmental test and evaluation, and jointly assure COMNAVAIR concerning the readiness of the systems for operational evaluation and fleet use. Further, he will maintain active liaison with cognizant personnel in OPNAV, the Operational Test and Evaluation Force, and the Office of the Secretary of Defense on the operational test and evaluation of the weapon system.

b. Air Force Unique. The Headquarters, U.S. Air Force (HQ USAF) has directed Headquarters, Air Force Systems Command (HQ AFSC) participation via Program Management Directive number R-Q 3108 (2)/63256F; and HQ AFSC has outlined ASD participation by AFSC Form 56, number 63256-84-21.

(1) Within ASD, the Commander, ASD has tasked the Deputy for Airlift and Trainer Systems (ASD/AF) to be the single focal point for Air Force operational, technical, business management, financial, configuration/data management, logistics support (with Acquisition Logistics Division resources), and test/evaluation matters unique to Air Force equipment. The Deputy for Air Force Air Vehicle will ensure proper coordination with ASD/AF.

(2) ASD/AF has the responsibility and authority for all Air Force unique developments as agreed to in a JOP. ASD/AF will be responsible for carrying out service program direction and providing policy and decision instructions. The Deputy for Air Force Air Vehicle will coordinate these activities with the Joint Program Office and ASD/AF.

c. JOP's.

(1) JOP's may be negotiated and executed between the executive and participating services, as required, to clearly define the procedures to be followed by each service in meeting total V-22 system requirements. Reference (j) requires that JOP's for integrated logistic support and for test and evaluation be developed. The following areas are candidate subjects for additional JOP's: Engineering cognizance, configuration management, procurement and production, operational flight trainers, financial management and status reporting (program control), personnel subsystem including training, systems safety, and data management. Additional JOP's among the services or with other agencies may be authorized as appropriate to program needs.

(2) The joint operating agreements appearing in reference(s) will be used as the baseline, where appropriate, for developing the JOP's.

(3) The PM and the deputies for service vehicles are authorized to negotiate JOP's for their respective services, subject to their parent services' unique requirements, procedures, and approval. Cognizant commands will assist in the negotiation and execution of these procedures and agreements.

9. **Participating Organizations.** Communication, action, or inaction, in any form, which prime contractors may interpret as direction will be conducted through the appropriately assigned NAVAIRHQ contracting officer.

a. NAVAIRHQ. In keeping with the NAVAIRHQ concept of matrix management, all NAVAIRHQ elements will support the PM and his staff according to those responsibilities assigned in references (m), (n), (o), and (t). The PM is authorized direct liaison with all NAVAIRHQ divisions and directorates in exercising his responsibilities. When disagreement occurs, actions directed by the PM will be continued or instituted until resolution.

b. Naval Systems Command. Naval systems commands will support the PM according to those material support responsibilities assigned by CNM in systems command charters, reference (u).

c. Air Force. HQ USAF, HQ AFSC, and Air Force Logistics Command elements will support the PM as required.

d. Marine Corps. Headquarters, U.S. Marine Corps and Marine Corps Development and Education Command elements will support the PM as required.

e. Field Activities. Activities participating in the execution of the program are listed in appendix B, and others will be added as required. These assignments reflect the guidance of reference (p). Direct liaison with all activities concerned with the program is authorized. Under the PM's guidance, formal work assignments to NAVAIR field activities will be coordinated by the appropriate functional organization in NAVAIRHQ. Deputies for service vehicles will coordinate work assignments to their respective services' activities, initially clearing them with appropriate headquarters organizations following established procedures.

10. **Congressional and Public Information.**

COMNAVAIR is responsible for coordinating and/or disseminating public information relative to the program within the DoD, to legislative bodies, to industry, and to the general public. This responsibility has been delegated to the NAVAIRHQ Legislative and Public Affairs Office (AIR-07D).

11. **Resources Assessment.**

a. The PM will evaluate and document the effect of proposals to increase or decrease the resources authorized for the execution of the program, and will determine the effect of proposed changes on approved cost, schedules, procurement plans, supportability, and performance objectives. Officials having final decision authority during programming, reprogramming, and budgeting deliberations will consider the PM's evaluation.

b. The PM will inform the Chief of Naval Operations (and others as directed by COMNAVAIR) via the chain of command of any instances where the requirements of the program cannot be met within the resources and time available.

12. **Program Transition or Disestablishment.**

This program will be reviewed periodically to determine if it has accomplished its objectives. If the review indicates the objectives have been or are about to be accomplished, the PM will develop a transition plan per reference (m) and with the participating services to ensure a smooth disposition of remaining resources, responsibilities, and functions.

/s/ THOMAS H. McMULLEN
Lieutenant General, USAF
Commander, Aeronautical
Systems Division

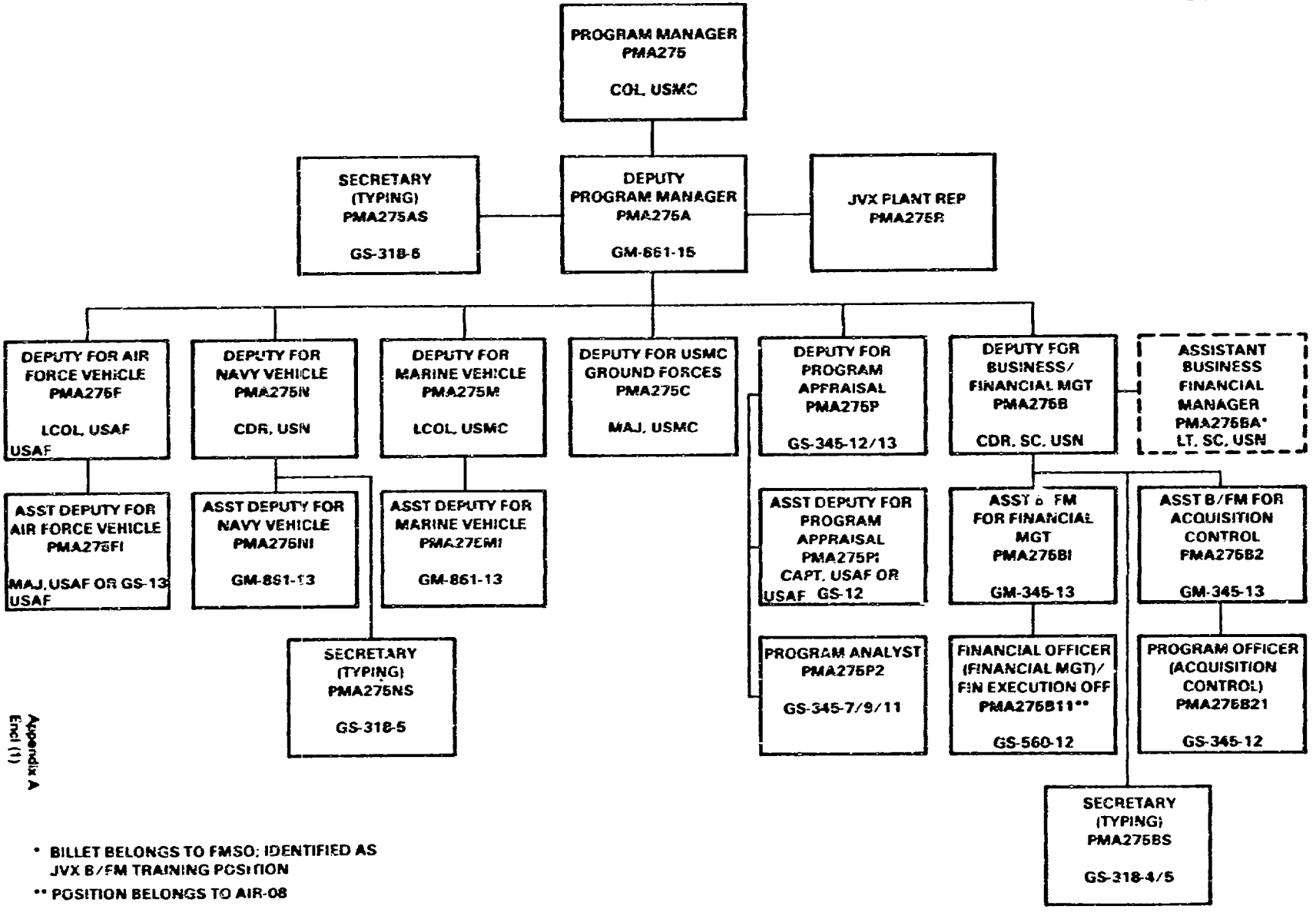
/s/ J. B. BUSEY
Vice Admiral, USN
Commander, Naval Air
Systems Command

FOOTNOTE:

1/ The charter is based on Enclosure 1 to NAVAIRINST 5400.104A, and revised to more accurately reflect the current environment of the V-22 program.

V-22 OSPREY PROGRAM OFFICE ORGANIZATION

NAVAIRINST 5400.104A
26 MAR 85



Appendix A
Encl (1)

* BILLET BELONGS TO FMSO; IDENTIFIED AS JVX B/FM TRAINING POSITION

** POSITION BELONGS TO AIR-08

Appendix B. ACTIVITIES PARTICIPATING IN THE JVX PROGRAM

ACTIVITY	LOCATION	TYPE OF WORK PERFORMED
1. Navy		
Naval Air Test Center	Patuxent River, MD	Development test and evaluation
Naval Air Development Center	Warminster, PA	Air system and aircraft system development
Naval Avionics Center	Indianapolis, IN	Avionics system support
Operational Test and Evaluation Force	Norfolk, VA	Operational test
Naval Training Equipment Center	Orlando, FL	Training systems
Naval Air Technical Training Center	Memphis, TN	Maintenance trainers
Navy Aviation Supply Office	Philadelphia, PA	Spares,spare parts, and support equipment support
Naval Air Technical Services Facility	Philadelphia, PA	Publications and technical data
Naval Air Engineering Center	Lakehurst, NJ	Aircraft/ shipboard compatibility
Naval Weapons Center	China Lake, CA	Weapons test support
Naval Weapons Engineering Support Activity	Washington, DC	Production support

Appendix B. ACTIVITIES PARTICIPATING IN THE JVX PROGRAM (Continued)

ACTIVITY	LOCATION	TYPE OF WORK PERFORMED
Naval Aviation Logistics Center	Patuxent River, MD	Logistics management assistance
Naval Air Rework Facility	Cherry Point, NC	Maintenance engineering support
Naval Air Rework Facility	Pensacola, FL	Maintenance engineering support
Naval Air Rework Facility	North Island, CA	Maintenance engineering support
Naval Surface Weapons Center	Dahlgren, VA	Systems safety assistance
David W. Taylor Naval Ship Research and Development Center	Bethesda, MD	Wind tunnel/ engineering support
Naval Air Propulsion Center	Trenton, NJ	Propulsion and power systems
Naval Ordnance Station	Indian Head, MD	Cartridge activated devices
2. Air Force		
Aeronautical Systems Division	Wright-Patterson AFB, OH	Aircraft integration support
Air Force Acquisition Logistics Division	Wright-Patterson AFB, OH	Logistics support
Air Force Operational Test and Evaluation Center	Kirtland AFB, NM	Developmental operational evaluation

Appendix B. ACTIVITIES PARTICIPATING IN THE JVX PROGRAM (continued)

ACTIVITY	LOCATION	TYPE OF WORK PERFORMED
Air Force Systems Command	Andrews AFB, DC	Staff support/USAF
Air Force Logistics Command	Wright-Patterson AFB, OH	Logistics support
Air Force Flight Test Center	Edwards AFB, CA	Testing
Electronic Systems Division	Hanscom AFB, MA	Systems integration
Armament Development and Test Center	Eglin AFB, FL	Systems integration
3. Marine Corps		
Marine Corps Development and Education Command	Quantico, VA	Operational test and evaluation
4. Other		
National Aeronautics and Space Administration, Ames Research Lab	San Jose, CA	Technical services and support
National Security Agency	Washington, DC	DSAP
Defense Intelligence Agency	Washington, DC	Intelligence support
Defense Logistics Agency	Alexandria, VA	Logistics support
Defense Contract Audit Agency	Alexandria, VA	Accounting services and financial advisory support

APPENDIX C

MEMORANDUM OF AGREEMENT ON MULTISERVICE OPERATIONAL TEST AND EVALUATION (MOT&E) AND JOINT TEST AND EVALUATION (JT&E)

15 MAY 1986

1. INTRODUCTION.

a. Purpose. This Memorandum of Agreement (MOA) provides a basic framework for T&E conducted by two or more OT&E agencies in accordance with DoD Directive (DoDD) 5000.3, Test and Evaluation, 12 March 1986.

b. Policy. This memorandum provides guidelines for planning, conducting, evaluating, and reporting T&E involving two or more OT&E agencies. The agreements contained herein apply to both JT&E and MOT&E (as defined in paragraph c below). They are the standard for these programs; this MOA may be supplemented for program-unique considerations.

c. Definition of Terms. For the purpose of this memorandum, the following terms are defined:

(1) *Deficiency Report.* A report of any condition which reflects adversely on the item being tested and which must be reported outside the test team for corrective action.

(2) *Executive Agent/ Service.* See Lead Service.

(3) *Joint T&E.* An Office of the Secretary of Defense (OSD)-directed T&E program structured to evaluate concepts or system operational or technical performance under realistic conditions with two or more Services participating.

(4) *Lead Service.* The Service designated by the Secretary of Defense, or as a result of Service initiatives, to be responsible for management of a MOT&E or JT&E program. The terms executive agent and lead Service are considered synonymous. Lead Service is the preferred term.

(5) *Multiservice OT&E.* OT&E conducted by two or more Services for systems to be acquired by more than one Service, or for a Service's systems which have interfaces with equipment of another Service.

(6) *Operational Test and Evaluation.* Field testing, under realistic conditions, of any item of (or key component of) weapons, equipment, or munitions for the purpose of determining the effectiveness and suitability of the weapons, equipment, or munitions for use in combat by typical military users; and the evaluation of the results of such tests.

(7) *Support Agent.* An organization that provides technical, analytical assistance to the Joint Test Director (JTD), particularly in the development of the feasibility study, test design, and in preparation of the test report. The agency is normally a federally funded contract research center, but may be any DoD organization or qualified contractor.

(8) *Supporting Service.* A Service designated by the Secretary of Defense, or as the result of Service initiatives, to

assist the designated lead Service in the management of a MOT&E or JT&E program.

2. COMMON ELEMENTS OF MULTISERVICE OT&E AND JOINT T&E.

a. Relationship Between Lead Service and Supporting Service.

(1) The designated lead Service will have the overall responsibility for management of the MOT&E or JT&E program and will ensure that supporting Service requirements are included in formulation of the basic resource and planning documents. The supporting Service will ensure that all of their requirements are made known, and will assist the lead Service in prosecution of the T&E program. Enclosures (1) and (2) contain guidelines with regard to duties and responsibilities of participants which will be considered in the establishment and conduct of all MOT&E and JT&E test programs.

(2) Provisions will be made on every MOT&E program for a test management council (TMC) which will arbitrate all disagreements that cannot be resolved at the working level. The TMC will be composed of one senior representative from each participating agency headquarters and will be chaired by the lead Service representative.

(3) Issues between participants will be resolved at the lowest level possible. It is anticipated that most will be resolved either internally or by the TMC. In the rare event that agreement cannot be reached at or below the TMC level, each party to the disagreement will prepare position papers outlining the problem, the position taken and the supporting rationale, for their respective OT&E agency commander. The agency commanders involved will confer to resolve the disagreement. In the unlikely event that agreement cannot be reached by the agency commanders, they will refer the disagreement to their respective Service chiefs.

b. Resources. The lead Service, or before the designation of the lead Service for JT&E, the projected lead Service, in coordination with the supporting Services will include all resource requirements in a JT&E Consolidated Resource Estimate (CRE). The CRE will contain, as a minimum, all of the information described in the checklist contained at enclosure (7). The Test and Evaluation Master Plans (TEMPs) can serve this purpose for MOT&E. The supporting Services will prepare their portions of the JT&E CRE in their format and staff them through their normal Service channels.

c. Funding. Funding for JT&E and MOT&E will be in accordance with Chapter 251 of DOD 7110.1-M, the Budget Guidance Manual, and applicable Service directives.

(1) The individual Services will budget for funds required to support their individual participation in MOT&E and JT&E, except for items funded by OSD.

(2) In MOT&E, each Service will budget for the testing necessary to accomplish their assigned test objectives and for participation of their personnel and equipment in the entire test program.

(3) In OSD-directed JT&E, OSD disperses PE 65804D funds to the test force to pay for costs unique to the needs of a joint test. On rare occasion, a Service may fund an item which OSD should fund; in these instances, negotiations result in the test force reimbursing the Service. Examples of these costs are: feasibility studies of proposed joint tests; provisions for test design and

planning support for selected joint tests; development, procurement, installation, and operation of special instrumentation; transportation, travel, and per diem costs for assigned members of the Joint Test Director's staff; modification of test articles to permit obtaining test data; provisions for data collection, reduction analysis, and test reporting Services; and reimbursable costs identified in DODD 3200.11, Use, Management and Operation of Department of Defense Ranges and Test Facilities.

3. MULTISERVICE OT&E.

a. OSD-Directed MOT&E. MOT&E planning, conduct, reporting, and evaluation shall include the participation and support of all affected DOD components, including the Services' operational test agencies.

b. Test Team Structure. MOT&E may be conducted by a multiservice test team or concurrently with separate test teams, as the participating agencies deem necessary for a given program. The basic test team structure is shown in enclosure (3). Service test teams work through a Service Deputy Test Director, or a senior Service representative. The multiservice Test Director will exercise test management authority over requirements and efficient scheduling of test events, but not operational control of the test teams. The Deputy Test Directors will exercise operational control or test management authority over their Service test teams in accordance with their Service directives. Additionally, they will act as advisors to the multiservice Test Director; represent their Service's interests; and be responsible, at least in an administrative sense, for resources and personnel provided by their Services. Test team structure below the level of the Deputy Test Director will be determined on a program-by-program basis by the individual Services.

c. Test Planning. Test planning for MOT&E will generally be accomplished in the manner prescribed by lead Service directives. The below listed general procedures, however, will be followed:

(1) The lead Service OT&E agency will begin the planning process by issuing a call to the supporting Service OT&E agencies for critical operational issues (COIs) and test objectives.

(2) The lead Service OT&E agency will consolidate these COIs and test objectives which will then be approved by all Services OT&E agencies involved in the test. Service-unique issues will be included as COIs and/or objectives.

(3) The lead Service OT&E agency will accommodate supporting Service OT&E requirements and inputs in the formal coordination action of the TEMP.

(4) Participating OT&E agency project officers will meet for the purpose of assigning responsibility for accomplishment of test objectives to each OT&E agency. These assignments will be made in a mutually agreeable manner. Each agency will then be responsible for resource identification and accomplishment of its assigned test objectives under the direction of the lead Service OT&E agency.

(5) Each participating agency will then prepare the portion of the overall test plan(s) for its assigned objectives, in the lead Service's test plan(s) format, and will identify its data needs.

(6) The lead Service's OT&E agency will prepare the MOT&E plan(s), consolidating the inputs from all supporting agencies. After consolidation, the OT&E plan(s) will be coordinated

with the supporting Services' OT&E agency.

d. Deficiency Reporting in MOT&E.

(1) The deficiency reporting system of the lead Service will normally be used. All members of the multiservice test team will report deficiencies in that system. All information needed by the participants will be collected. Enclosure (5) is an example of a possible form to be used for deficiency reporting. Each deficiency report will be coordinated with all Deputy Test Directors prior to release. If the Test Director or any Deputy Test Director disagrees with the report, he may attach an explanation of his disagreement to the deficiency report. The deficiency report will then be submitted to the appropriate developing agency with that explanation attached. The underlying philosophy is that each participating agency will be allowed to report all deficiencies that it identifies; the lead Service will not suppress those reports. Each Deputy Test Director will be responsible for submitting deficiency reports into his own Service's deficiency reporting system if his OT&E agency so requires.

(2) The lead OT&E agency will ensure a system is set up to track reported deficiencies and to provide periodic (monthly is preferred) status reports of those deficiencies to the participating OT&E agencies and to the test team. Enclosure (6) identifies the minimum information which must be maintained in the tracking system.

(3) Items undergoing test will not necessarily be used by each of the Services for identical purposes. As a result, a deficiency considered disqualifying (a deficiency deemed to be of such magnitude that the system will not meet a COI) by one Service is not necessarily disqualifying for all of the Services. Deficiency reports of a disqualifying nature must include a statement by the concerned Service of why the deficiency has been so classified. It should also include statements by the other Services as to whether or not the deficiency significantly affects them.

(4) In the event that one of the participating Services identifies a deficiency that it considers warrants termination of the test, the circumstances should be reported immediately to the Test Director. All testing will be suspended to afford participating Services an opportunity to discuss the deficiency. If all participants agree that the test should be terminated, the test will be halted until the deficiency is corrected. If appropriate, participants may determine that tests can continue safely on a limited basis pending subsequent correction of the deficiency. If agreement cannot be reached concerning the nature and magnitude of the deficiency, it will be necessary for the Test Director to consider what portions of the test, if any, are unaffected by the deficiency and can be continued safely while the deficiency is being corrected. Immediately upon making such a determination, the Test Director shall provide the OT&E agencies with the circumstances concerning the deficiency, the positions put forth by the Deputy Test Director(s), his decision and reasons therefor.

e. Test Reporting. The following test reporting policy will apply for all MOT&E programs:

(1) Each participating OT&E agency will prepare an independent evaluation report in its own format and will process that report through its normal Service channels.

(2) Interim test reports will normally not be prepared. For test phases which extend for lengthy periods, interim test reports should be submitted at least annually. Test reporting require-

ments will be defined in the TEMP. When required, interim reports will be prepared in accordance with lead Service's directives and coordinated with all participating OT&E agencies prior to release.

(3) For major programs, the lead Service will prepare and coordinate the single (interim or final) report reflecting the system's operational effectiveness and suitability for each Service. It will synthesize the different operational requirements and operational environments of the involved Services. It will state findings, put those findings into perspective, and present rationale why there is/is not consensus on the utility of the system.

(a) The participating Services' independent evaluation reports will be appended to final reports.

(b) This report will be submitted to OSD's Director of Operational Test and Evaluation (DOT&E) and OSD's Deputy Under Secretary of Defense for Research and Engineering, Test and Evaluation (DUSDRE-(T&E)) at least 45 days prior to a milestone decision or the date announced for the final decision to proceed beyond low rate initial production (LRIP). An interim summary OT&E report shall be submitted if the formal end of test phase report is not available 45 days prior to the milestone review. For programs that do not have a traditional milestone or LRIP decision, the test report will be submitted 60 calendar days after the last test event.

(4) For those reports not requiring submission to DOT&E and DUSDRE(T&E), a single multiservice report is not required. The approved independent evaluation reports will be distributed to all participating agencies. These reports should be forwarded to the other participating agencies 60 calendar days after the last test event.

(5) The lead Service OT&E agency will be responsible for preparing the Defense Systems Acquisition Review Council (DSARC) briefing(s) which will be coordinated with all participating OT&E agencies.

4. JOINT TEST & EVALUATION.

a. <u>OSD-Directed JT&E</u>. DoDD 5000.3 specifically directs the Services to participate in/monitor the development of the JT&E feasibility study and the test design and to coordinate the results of both efforts prior to commitment of any resources. This implies that the Services should become involved early in the planning phase of all OSD-directed JT&E programs, to include active participation in the JT&E nomination process. This will provide the OT&E agencies an opportunity to review and comment on all JT&E programs. The purpose of this review will be to ensure that the JT&E program and its associated documentation contains the following critical information:

(1) Specific definitions of the critical issues to be investigated.

(2) A specific listing of the critical and major objectives of the JT&E program.

(3) An enemy threat assessment that has been coordinated among the participating Services and validated by the Defense Intelligence Agency (if applicable).

(4) The anticipated impact that the JT&E program will have on force readiness and training.

(5) An estimate of the total costs and an identification of fund sources.

(6) A schedule of program events which will permit timely preparation of Service documentation and budgeting to accomplish program objectives.

If, during review of JT&E program documentation, the OT&E Commanders find that the above areas are not adequately covered, they shall mutually discuss problems and submit separate comments to their respective Service chiefs.

b. Early Service Involvement. Services will be responsible for the conduct of JT&E feasibility studies. OSD support agencies or independent contractors may be utilized by the Services to assist in the preparation of the feasibility studies. However, in all circumstances, the support agents/contractors will be working for the Service(s) responsible for the feasibility study. Early in the feasibility study of a designated joint test, the lead Service JT&E point of contact (POC) will coordinate an ad hoc planning meeting with the remaining Service JT&E POCs. For joint tests the initial Service POCs are:

USA	CSTE-RMD-J
USN	OPNAV 983
USAF	AFOTEC/JT
USMC	MCOTEA

Following this meeting, the Service POCs will identify a Service representative to work with the support agent for the specific joint test. Service representatives may visit with support agents independently but will inform other Service representatives of the meeting in advance.

c. Test Force Structure. Unless specific direction to the contrary is given by the OSD, the basic joint test force structure will be as shown in enclosure (4). Service Deputy Test Directors (DTDs) are intended to be the senior Service representatives. They will act as advisors to the JTD, will represent their Service's interests, and will be responsible for the personnel administration of individuals of their Service who are assigned to the JTD Staff. They will be consulted by the JTD in resolving personnel problems involving members of their Service, whether such members are assigned to the Joint Test Force (JTF) or not. In executing actions intended to change personnel attached to the staff, JTDs will be guided by and conform with applicable Service directives. Since DTDs will be advisors to the JTD and will represent their Service's interest, they will normally have reporting chains back to their Service and/or OT&E agency commander/director. DTDs may also serve as functional directors reporting to the JTD. The number of functional directors reporting to the JTD may vary with the size of the program. Enclosure (4) illustrates the preferred separation of functions. The joint test force structure will be thoroughly integrated; i.e., there will be no Service test team identification. OT&E agency commanders/directors will support inclusion of the above intent in all JTD charters.

5. QUADRI-SERVICE REVIEW.

a. The OT&E Commanders will confer on an as-needed basis to exchange views on OT&E matters of mutual interest.

b. Responsibility for issuing a call for a review of the MOA will be rotated among the Services. This call will be initiated at least 30 days prior to the anniversary date of the MOA. That Service also has the responsibility for calling such meetings as are required to reach agreement on proposed changes/additions to this MOA, and will take the lead in publishing change pages or republishing the entire document.

c. Terms of this understanding be-

come effective upon signature by all parties and may be revised by mutual consent provided such changes are accomplished by written agreement.

/s/JAMES E. DRUMMOND, Major General, USA Commander, USAOTEA

/s/MICHAEL D. HALL, Major General, USAF Commander, AFOTEC

/s/J.T. PARKER, Rear Admiral, USN COMOPTEVFOR

/s/H. L. SEAY, Colonel, USMC Director, MCOTEA

DUTIES AND RESPONSIBILITIES OF PARTICIPANTS IN MULTISERVICE OT&E

Functional Area	Lead Service	Supporting Service(s)
1. Personnel	-Assign the OT&E Director	-Assign deputy test directors to the test team
	-In conjunction with the supporting Service(s), establish joint manning requirements	-Establish Service manning requirements to support the joint manning requirements
	-Staff the test team as indicated in the joint manning document	-Staff the test team as directed by the Service manning document
2. Administration	-Provide initial administrative support services until the formulation and staffing of the test team	-Provide administrative support to Service representatives until staffing of the test team
	-Recommend functional tasks to be performed by each level of the test team	-Provide administrative support for Service-unique requirements
		-Provide functional task requirements to the lead Service
3. Funding	-Fund initial organizational, planning, and administrative costs except TDY and other Service-unique requirements	-Fund own Service TDY costs
	-Fund own Service TDY and unique requirements	

Enclosure (1)

	-Funding of test requirements will be IAW DOD and Service directives	-Funding of test requirements will be IAW DOD and Service directives
4. Threat Assessment	-Ensure that a coordinated threat assessment has been developed IAW lead Service directive(s), coordinated with the DIA, and is provided to all participants -Provide an updated threat assessment to each participant prior to each major program review	-Support lead Service efforts in the development and periodic update of the threat assessment
5. Resources	-Consolidate total resource requirements and include same in basic program documents -Indicate Service resonsible for providing each resource	-Identify for the lead Service all resources required to conduct the test -Extract Service resource requirements from the basic documentation -Prepare Service documents to support basic resource requirements document
6. Data Management[1]	-Ensure that a comprehensive data collection/ plan is formulated -Designate a central repository for data collected	-Support lead Service in preparing the data collection/management plan -Ensure that all data collected are made available to the lead Service for storage into

		the central data data depository
	-Provide ready access to the collected data to all participating agencies	
7. Documentation	-Prepare overall program documentation in accordance with lead Service directives	-Provide inputs to the basic documents
	-Make provisions for the attachment for Service-unique documentation requirements as annexes to the basic documents	-Provide Service-unique documentation requirements to lead Service as an annex to the basic documentation
	-Prepare an independent operational evaluation report in accordance with Service directives	-Prepare an independent operational evalu ation report in accordance with Service directives
8. Deficiency Reporting	-Provide deficiency reporting procedures, formats, and direction. Accept deficiency reports (DRs) from DTDs. Submit DRs to appropriate program managers. Ensure supporting Services receive deficiency status reports periodically	-Submit DRs concerning Service-unique or general problems with the test item in the format prescribed by the lead Service. Use lead Service prescribed definitions, DR system, and forms

NOTE:

1. To ensure a progressive evaluation of the system, there will be an unrestricted exchange of data only among the OT&E agencies and/or test teams. Said data shall not be promulgated or otherwise allowed to be shared with individuals or organizations not a signatory to this MOA.

PARTICIPANTS IN JOINT TEST AND EVALUATIONS

ACTIONS NORMALLY ACCOMPLISHED BY THE

DIRECTOR OF OPERATIONAL TEST AND EVALUATION (DOT&E)

1. Select JT&Es (in coordination with DUSDRE(T&E) and the Services).

2. Plan, program, and budget for JOT&E.

3. Fund test unique costs for JOT&E (in accordance with DOD Budget Guidance Manual 7110-1-M).

4. Appoint the Lead Service for JOT&E.

5. Review qualifications and act as approval authority for the Lead Service nomination of the Joint Test Director for JOT&E.

6. Charter JOT&E.

7. Designate supporting Service(s) for JOT&E.

8. Act as the DOD approval authority for feasibility studies for JOT&Es (in coordination with the Service(s)).

9. Approve test designs for JOT&E (in coordination with the Services and the Joint Test Directors).

10. Approve field test plans for JOT&E (in coordination with the Service and Joint Test Directors).

11. Direct an independent evaluation (by a support contractor) of JOT&E test results when required.

12. Co-chair (with DUSDRE(T&E)) the JT&E Senior Advisory Council.

Enclosure (2)

PAR 'ANTS IN JOINT TEST AND EVALUATIONS

ACTIONS NORMALLY ACCOMPLISHED BY THE

DEPUTY UNDERSECRETARY OF DEFENSE FOR RESEARCH AND ENGINEERING (TEST AND EVALUATION) (DUSDRE(T&E))

1. Administer the nomination process for proposed JT&E.

2. Select JT&Es (in coordination with DOT&E and the Services).

3. Plan, program and budget for JDT&E.

4. Fund test-unique costs for JDT&E (in accordance with DOD Budget Guidance Manual 7110-1-M).

5. Appoint the lead service for JDT&E.

6. Review the qualifications and act as approval authority for the Lead Service nomination of the Joint Test Director for JDT&E.

7. Charter JDT&E.

8. Designate supporting Service(s) for JDT&E.

9. Act as the DOD approval authority for feasibility studies for JDT&E (in coordination with the Services).

10. Approve test designs for JDT&E (in coordination with the Services and Joint Test Directors).

11. Approve field test plans for JDT&E (in coordination with the Services and Joint Test Directors).

12. Direct an independent evaluation (by a support contractor) of JDT&E test results when required.

13. Establish overall policy and direction (in coordination with DOT&E) for JT&E programs.

14. Co-chair (with DOT&E) the JT&E Senior Advisory Council.

15. Provide a chairperson for the OSD JT&E Planning Committee.

PARTICIPANTS IN JOINT TEST AND EVALUATION

DUTIES AND RESPONSIBILITIES OF THE

LEAD SERVICE (EXECUTIVE AGENT/SERVICE)

1. Appoint the Joint Test Director and Deputy Test Director in coordination with DOT&E/DUSDRE(T&E) as appropriate.

2. Provide administrative support for feasibility studies and approved JT&E.

3. Provide adequate facilities (when available) for the JTF located on an installation under control of the lead Service.

4. Provide appropriate Service resources.

5. Obligate funds necessary to support the lead Service's portion of the JT&E (excluding test unique costs funded by OSD).

6. Support test planning, execution, evaluation, and reporting.

7. Designate Service units responsible for providing JT&E support.

8. Participate in the preparation and coordination of the JT&E feasibility study and test design.

9. Contact DOD's Joint Test Support Center[1] to learn of any information which would be of value in planning, conducting, or reporting on joint tests. Coordinate with the supporting Service(s) as appropriate.

10. Review and coordinate on the JT&E field test plan.

11. Prepare the Consolidated Resource Estimate.

12. Identify special Service requirements for data or special test events which may be incorporated into the test.

13. Provide fully qualified personnel to the JTF.

14. Designate a unit or agency within the Service responsible for Service coordination.

15. Designate a by name point of contact for each specific JT&E.

16. Issue a Service test directive.

17. Procure and/or modify test items, systems, equipment, and instrumentation as requested by the JTD and coordinated by the Service (costs funded by OSD).

18. Conduct an independent evaluation of the test, if desired.

19. Review final test report.

20. Provide a permanent member to the JT&E Senior Advisory Council.

21. Provide a permanent member to the OSD JT&E Planning Committee.

NOTE:

1. DoD Joint Test Support Center, 1517 Westbranch Drive, McLean, VA 22102, (703) 827-9200.

PARTICIPANTS IN JOINT TEST AND EVALUATIONS

DUTIES AND RESPONSIBILITIES OF THE

SUPPORTING SERVICES

1. Appoint the Deputy Test Director in coordination with DOT&E/DUSRE(T&E).

2. Provide adequate facilities (when available) for the JTF located on an installation under control of the supporting Service.

3. Provide appropriate Service resources.

4. Obligate funds necessary to support the supporting Service's portion of the JT&E (excluding test unique costs funded by OSD).

5. Support test planning, execution, evaluation, and reporting.

6. Designate Services' units responsible for providing JT&E support.

7. Participate in the preparation and coordination of the JT&E feasibility study and test design.

8. Review and coordinate on the JT&E field test plan.

9. Participate in the preparation of the Consolidated Resource Estimate.

10. Identify special Service requirements for data or special test events to be incorporated into the test.

11. Provide fully qualified personnel to the JTF.

12. Designate an individual or agency within the Service responsible for Service coordination.

13. Designate a by name point of contact for each specific JT&E.

14. Issue a Service Test Directive.

15. Procure and/or modify test items, systems, equipment, and instrumentation as requested by the JTD and coordinated by the Service (costs funded by OSD).

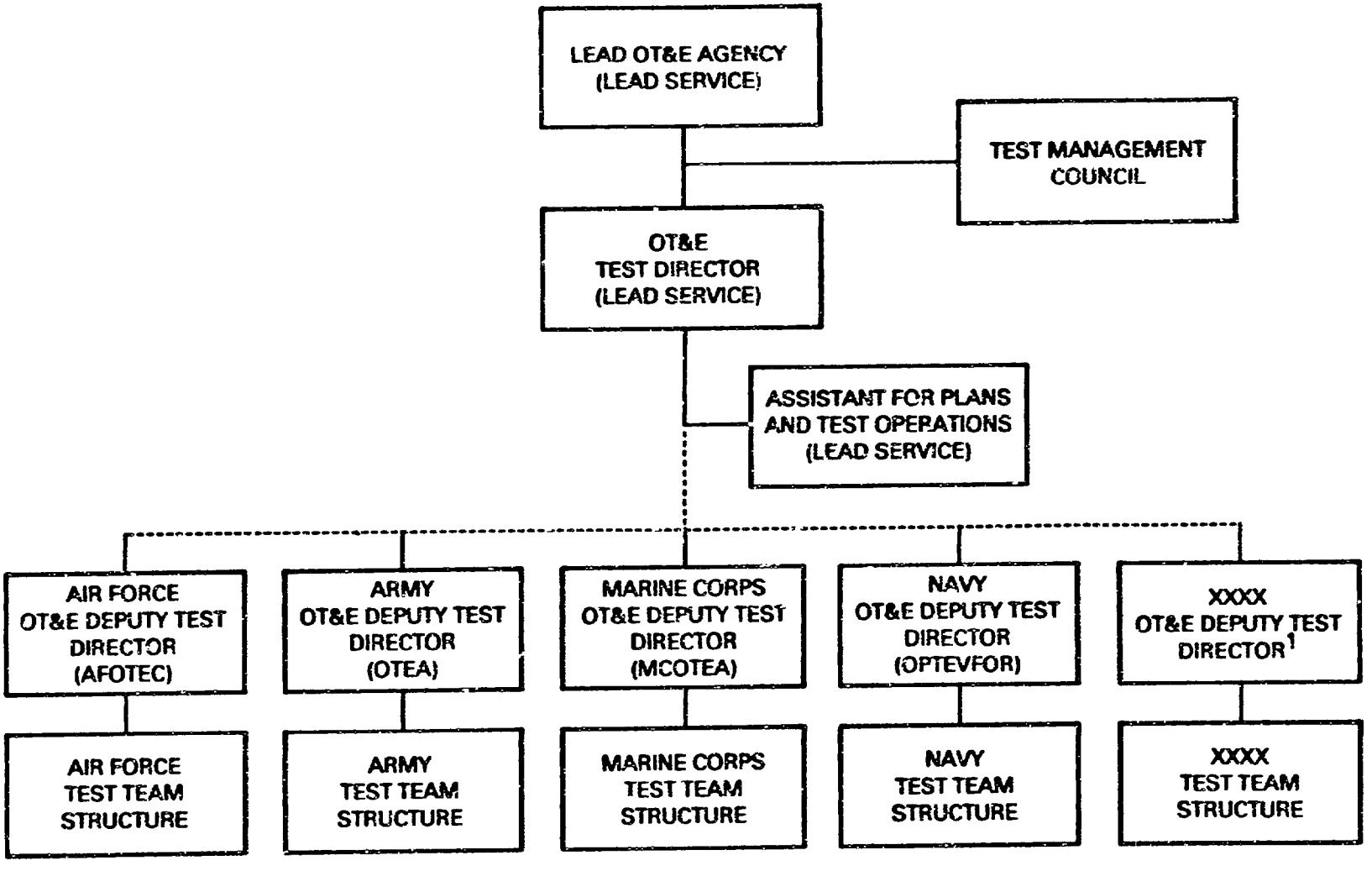
16. Conduct an independent evaluation of the test, if desired.

17. Review final test report.

18. Provide a permanent member to the JT&E Senior Advisory Council.

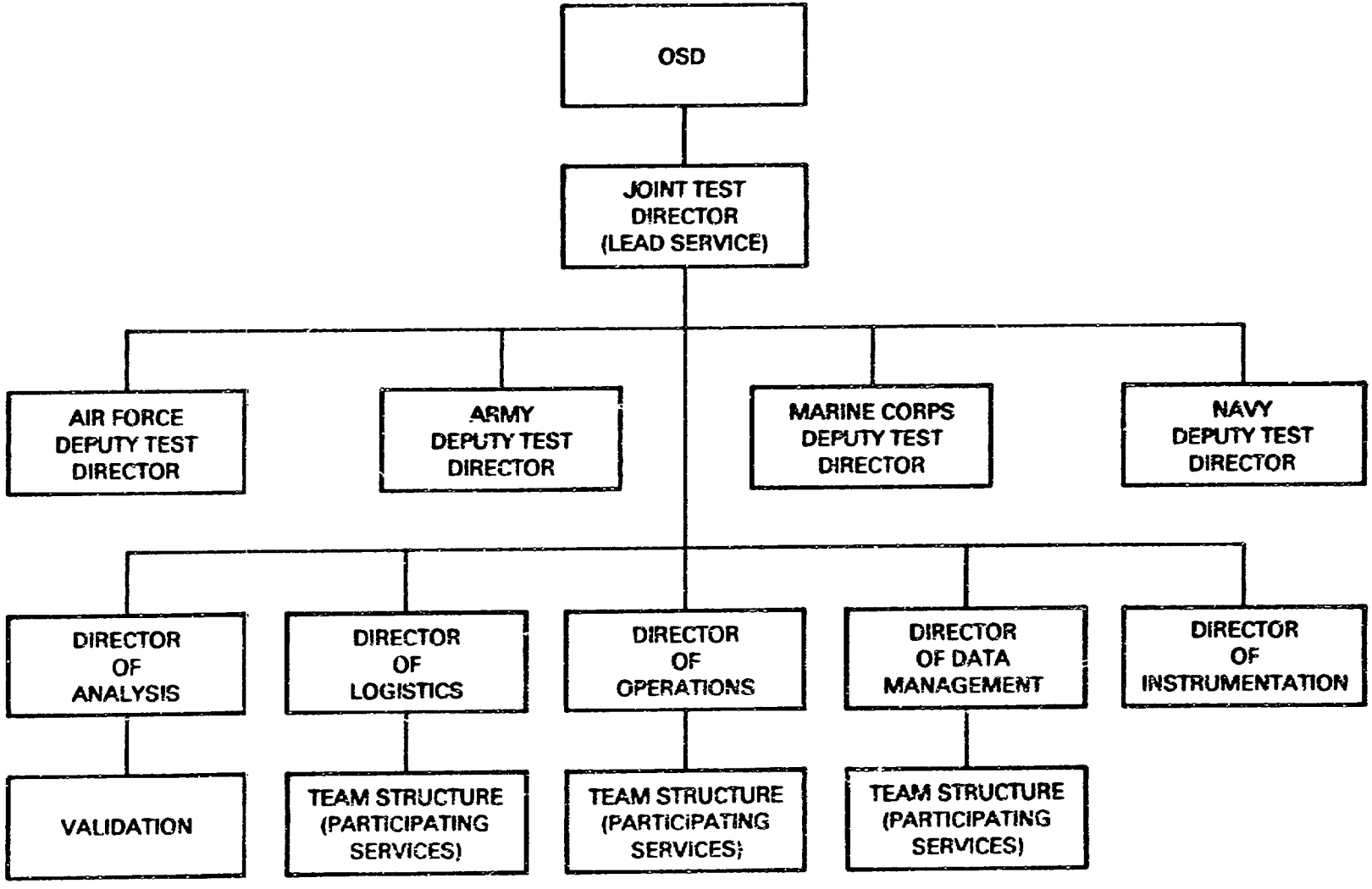
19. Provide a permanent member to the OSD JT&E Planning Committee.

SAMPLE
MULTISERVICE OT&E TEST TEAM COMPOSITION



1. USED FOR COMPLEX PROGRAMS WITH MANY PARTICIPANTS

SAMPLE
JOINT TEST FORCE COMPOSITION



ENCLOSURE (4)

SAMPLE
DEFICIENCY ANALYSIS SHEET (DAS)
DAS NUMBER _____

SYSTEM _____ PRIORITY _____

TITLE:

PCP/ECP NO. _____ WORK PACKAGE _____
RELATED DAS NO.(S) _____ MODULES AFFECTED _____

SOURCE _____ DATE _____
ACTION _____ DATE _____
CORRECTED _____ DATE _____

STATEMENT OF PROBLEM

OPERATIONAL IMPACT (BY EACH PARTICIPATING SERVICE)

RELATED SYSTEMS IMPACT

SAMPLE
DEFICIENCY ANALYSIS SHEET (DAS)

ENCLOSURE (5)

SAMPLE
DEFICIENCY REPORT SUMMARY

CURRENT DATE ____________

EQUIP. NOMEN.	REPORT I.D.	REPORT DATE	TYPE OF DEFICIENCY	DEFICIENCY DESCRIPTION	COG. AGENCY	CLOSURE CODE	ACTION REF	REMARKS	STATUS	DATE INFORMATION		
										ACTION AC CLO. DATE	TEST EPR CLO. DATE	LAST UPDATE
	A		B		C	D			F			
AN/TYC-39, CNCE, ETC.	EPR KH-61, 11-23001-YC-20— [illegible]T, ETC.		INFO, MINOR INC, OPERATIONAL, ETC.	SHORT TITLE, PART NO., SUBASSEMBLY, ETC. PLUS PROGRAM EXAMPLES: 1. OX-54 INVERTERS FAILED 2. SOFTWARE PLT-B (E7R31) (DIAG) TIMING PROBLEM WHEN TTY ON LINE 3. VDU B CARD FAILURE	GTE, MSCS, ESD, RCA, ETC.	NEEDHAM, FORT HUACHUCA, ETC.	FH-MS-004, L69201, ESD LTR 18 MAR 79	DEPOT REPAIR/REPLACE, TAPE PATCH DUE BY 24 AUG 78, SEE ECP NX.009, ETC.	AC-ACTIVE, PE-PENDING CL-CLOSED			

A. SERVICE UNIQUE REPORT NUMBER; i.e. EPR KH-61
B. SERVICE UNIQUE TERMS-LIKE "MAJOR", "MINOR", ETC.
C. AGENCY RESPONSIBILE FOR FIXING THE PROBLEM
D. WHERE THE CORRECTIVE ACTIONS WILL TAKE PLACE
E. PROBLEM REPORT #, DATE OF LETTER SENT TO AGENCY, ETC.
F. SERVICE UNIQUE TERMS-LIKE "OPEN", "CLOSED", ETC.

SAMPLE
DEFICIENCY REPORT SUMMARY

ENCLOSURE (6)

JT&E CONSOLIDATED RESOURCE ESTIMATE CHECKLIST

1. Test Title
2. References
3. Purpose of test
4. Scope and Tactical Content
5. Test Objective
6. Lead/Participating Services
7. Services POC Lists
8. Test Installation Locations
9. Test Dates
10. Joint Test Directorate Personnel/Equipment
    a. Joint Test Staff
        (1) Data Management
        (2) Logistical
        (3) Administrative
        (4) Test Operations
        (5) Controllers
        (6) Data Collectors
    b. Aviation Support
    c. Signal/Communications
    d. Miscellaneous Equipment
    e. Training Requirements

11. Player Participants Personnel/Equipment

    a. Blue Force

        (1) Ground Players/Units

        (2) Aviation Players/Units

        (3) Ground Players Equipment

        (4) Aircraft Hours/Types

        (5) Training Requirements

    b. Red Force

        (1) Ground Players/Units

        (2) Aviation Players/Units

        (3) Ground Players Equipment

        (4) Aircraft Hours/Types

        (5) Training Requirements

12. Installation Support

13. Simulators/Surrogates

14. Instrumentation

15. ADP

16. Ammunition/Missiles

17. POL

18. Contractor Support

19. Funding Estimates

20. Milestones

APPENDIX D

INSTRUCTIONS FOR THE PREPARATION OF JOINT INTEGRATED LOGISTICS SUPPORT PLANS (JILSP)[1]

1. HOW TO PREPARE AND USE THE JILSP:

a. Preparation of the JILSP should be the responsibility of the executive service. Participating services should provide a central point of contact for coordination of the plan in their service.

b. The JILSP begins as a broad, objective-oriented document in the conceptual phase and becomes a more specific tasking and milestone scheduling document as a program progresses through the acquisition process. The JILSP should be tailored to the characteristics, needs, and complexity of each program and official program direction.

c. In preparing the JILSP, emphasize the specific tasks to be accomplished, who is responsible for the tasks, and the schedule for joint tasks. Brevity is essential; make all entries clear and concise. Keep narrative material to a minimum. Do not repeat information from other documents, unless it is needed to understand the JILSP. In tailoring the JILSP to the individual program, be innovative to accommodate unique program features consistent with comprehensive ILS planning.

d. Begin developing the JILSP during the conceptual phase of a program as part of the acquisition strategy. Guidance for preparation of the JILSP is included in paragraph 3.

e. Coordinate the JILSP with all participating and affected organizations. When signed by the PM, the JILSP becomes the ILS implementation plan that all participating activities must comply with.

f. Develop the JILSP so it can be used as a daily "working document" by working level personnel.

(1) Part I (General) and Part II (Concept/Strategy) contain all narrative portions of the plan. Narratives are not needed for any ILS function for which a milestone schedule chart is developed. While some general information may be necessary, those features and innovative techniques that are unique to the system must be identified. The narrative portion of the plan will be constructed so that changes are only required when basic objectives, concepts, or criteria are modified.

(2) Part III of the JILSP is made up of individual milestone charts that can be easily updated to show program status and to identify the interfaces where a change to a specific task affects another task(s) within any milestone schedule chart. When a computer-supported program management information system is used to reflect program status, consider using the computer system output products as Part III of the JILSP. Exercise caution to ensure that the outputs used are clear and complete enough, can be easily understood by reviewers and users of the JILSP without extensive study.

g. Services differences in ILS planning should be incorporated into the basic JILSP as an integral part of the planning process for the individual elements.

2. JILSP REVIEWS.

Review and update the JILSP whenever new program direction is received

or changes occur that warrant realignment of logistics support planning. Keep a log of the last time each page was reviewed and updated.

3. **JILSP FORMAT:**

a. Part I - General

(1) System Description - Briefly describe the system and equipment, its purpose, and general performance characteristics.

(2) Program Management - Identify all participating organizations and whether it is applicable to security assistance programs.

(3) Applicable Documents - Identify those documents that provide guidance or criteria necessary to accomplish functions described in the JILSP.

b. Part II - Concepts/ Strategy:

(1) Operations Concept - Briefly describe the operational concept in terms of mission scenarios, operational environment, employment concepts, and deployment plans. Provide sufficient detail (annual operating days, annual number of missions, mean mission duration, etc.) to provide input to the LSA process.

(2) Maintenance Concept - Briefly describe maintenance requirements, considerations, and constraints in terms of number of skill level of maintenance personnel, number of inventory items, maintenance environment, levels of maintenance, operational reliability and survivability requirements, failure diagnostic techniques, support equipment, and any maintenance considerations peculiar to the system. Identify any maintenance concept tradeoffs to be performed. Provide sufficient detail (turn-around time, mean time between maintenance, mean time to repair, etc.) to support LSA, data requirements, interim contractor support, and contractor logistics support.

(3) Logistics Support Analysis - Describe the LSA program. Include a brief description of LSA tasks required, the structure of the LSA data system and contractor-government interrelationships in the conduct of LSA.

(4) Acquisition Strategy - Briefly describe the procurement approach and define new or innovative contractual approaches for life cycle costs, logistics support costs, reliability improvement warranties (RIW), spares acquisition integrated with production concept, and interim contractor support. Also, describe budget and funding policies that are in addition to, or deviate from, standard procedures, etc.

(5) Test and Evaluation Concept - Briefly describe the test and evaluation concept in terms of DT&E, OT&E, participating organizations (including contractor), and management relationships. Include information on peculiar test requirements that are directly related to the ILS program (that is, reliability, maintainability, supportability, or contractual requirements related to a support cost guarantee or RIW). Address the interface between the LSA data system and the test program.

(6) Other Concepts - Briefly describe unique or innovative support concepts established or required to provide effective logistics support. Do not repeat standard support concepts, except to show the interface or rationale for the new concept. Briefly describe any peculiar aspects of the system, such as survivability considerations, technical data, support equipment, etc. Transportation and packaging concepts may be added, to describe unique requirements for protection and movement of system and equipment.

c. Part III - Milestone Schedule Charts (MSC):

(1) Use these charts to address specific ILS functions and to show the anticipated beginning and completion dates for each task and event, the assigned OPR, and the applicable resource requirements (as a minimum, identify OPRs by the three-letter office symbol).

(2) Use resource requirements to represent commitments agreed to by the participants.

(3) Coordinate the ILS milestones with all organizations involved, to ensure that tasks and events are complete, accurate, integrated with contractual requirements, and related to key "program" milestones.

(4) Do not include narrative in Part III of the JILSP.

(5) Set up the first MSC during the conceptual phase. During the Full-Scale Engineering Development (FSED), expand the MSC to include detailed tasks, responsibilities, and schedules for providing logistics support for the system or equipment.

(6) Delegate the responsibility for maintaining current status of the MSC to working level people in each ILS functional area. This includes tracking tasks and events, as well as reporting progress.

(7) Set up procedures to ensure that it becomes apparent that a milestone will not be met or when new program direction or guidance impacts the functional area.

(8) Set up and maintain management visibility of all hardware, down to and including all recoverable assemblies.

(9) MSCs should normally be prepared for each of the functional areas identified below, although MSCs for a specific program or project can be tailored by the ILSO, as approved by the PM. MSCs for the ILS elements should be developed using network analysis. Representative examples of the types of tasks and events that should be considered for tracking through MSCs are listed following each subparagraph heading. Individual MSCs must reflect the support to be provided by all participating services and agencies.

(a) Design Interface (DI) - Identify milestones for key program events where logistics-related design parameters are established, assessed, or modified, such as specification approvals, design reviews, audits, test and evaluation, demonstrations, configuration control boards, etc. Identify logistics-related design parameters for each DI functional area (such as R&M) and define detailed planning and implementation actions required to ensure requirements are achieved. Examples of planning implementation actions include:

(1) Develop supportability requirements for the initial and approved R&M program plan, establish design guidelines (derating, R&M parameter allocations, built-in test, etc.); conduct tradeoffs relative to readiness-related requirements and new technology opportunities; establish initial or updated predictions of operational readiness-related parameters; determine the period covered by the failure reporting and analysis; establish the period of active reliability growth or test analyze and fix; develop initial or approved requirements verification plan; determine requirements verification period(s); establish initial or approved production criteria, etc.

(2) Develop and document a lifecycle survivability program including procedures and schedules for

updating hardware documentation. Include plan to ensure that hardness of the system can be maintained throughout the system lifecycle.

(3) Develop an energy management plan; conduct tradeoff studies and analysis; develop energy conservation goals; perform modification; etc.

(4) Identify special power generation requirements and related cooling requirements.

(b) Maintenance Planning - Attain required maintenance capability for organizational and intermediate repair; do the depot maintenance source of repair decision tree analysis and interservice screening; establish depot maintenance capability; identify requirements for interim contractor support; identify facilities and training requirements; ensure that provisions are made for survivability, corrosion prevention, spectrometric oil analysis, nondestructive inspection, structural integrity, built-in test equipment, built-in test and performance monitoring, and maintenance activation planning, etc.

(c) Support Equipment - Identify, program, and deliver preoperational support equipment (SE); conduct SE guidance conference; set up requirements for SE, software, rights in data and computer resources, data, and documentation; review SE recommendations data (SERDS); identify, quantify, and program all operational SE; acquire and deliver SE on contract; identify, quantify, and program or acquire all logistics support elements needed to maintain the SE (spares, technical data, calibration requirements, etc.).

(d) Supply Support - Identify and program spares required for preoperational support; program disposition of residual preoperational assets; set up provisioning plans; identify requirements for interim contractor support; determine requirements for and conduct provisioning guidance conference; identify long leadtime items; identify, quantify, and program availability of spare and repair parts; etc.

(e) Packaging, Handling, and Transportation - Set up packaging, handling, and transportation concepts and criteria; identify packaging, handling, and transportation supply requirements; review transportability reports' review and evaluate data processed through the Container Design Retrieval System; develop transportation plan; review detailed packaging data; develop test support criteria; identify storage needs for hazardous materials, conventional munitions, etc.

(f) Technical Data - Prepare an engineering data management plan; define the engineering data required for specific organic functions; identify the tasks to be done during each program phase; set up plans and schedules for in-process reviews of engineering data; identify review team composition and responsibilities; conduct reviews; set up schedules for delivery of engineering data; prepare technical order publication plan; identify requirements for preliminary manuals, for operation and maintenance of all systems and equipments; prepare validation and verification plans; verify and validate technical orders; print and send out technical orders; etc.

(g) Facilities - Prepare facility requirements plan; conduct surveys to determine requirements for new or modified preoperational, operational, training, depot, or simulator facilities; budget for and construct facilities, etc.

(h) Manpower Requirements and Personnel - Insert a matrix of quantitative requirements for each function established for operation, supply,

and maintenance of the equipment, the personnel skill code (MOS/AFSC/NEC) and the job title required. Include whether military, government, civilian, or contractor; plan for operations/support commands to acquire personnel.

(i) Training and Training Support - Initiate ernment and contractor training; conduct follow-on crew and logistics support personnel training; identify, quantify, and program all required crew and maintenance training equipment, including simulators, as well as the logistics support elements required.

(j) Computer Resources Support - Deliver computer resources development plan; review computer program configuration item (CPCI) requirements; determine software needs, to meet system R&M requirements; deliver Part I specification; form a CRWG; publish the CRISP; etc. NOTE: This entry is deleted after publication of the CRISP and a cross-reference to the CRISP is entered herein.

(k) Modification Planning - Document modification and kit proofing requirements; set up kit production rates compatible with proposed modification schedules; send modification proposal analysis; coordinate with the proper support activity and configuration control board representative; implement modification schedule; evaluate effectiveness of modifications, etc.

(l) Special Considerations Set up requirements for contractor operations and support cost estimates and reporting: identify security assistance program requirements and site and depot activations; set up specific tradeoffs to be carried out by the contractor; set up requirements for the contractor to identify and submit the supply support plan, before the test; develop contractual requirements for support cost guarantee or RIW; develop a plan for assessing the accomplishment of hardware and support system goals; develop a verification and improvement program, site and depot activation, deficiency reporting (for example, specific routing and action channels for improvement or deficiency correction, material deficiency reporting), and other special considerations not included in one of the above categories.

FOOTNOTE:

1. Appendix D was prepared by Mr. John S. W. Fargher,Jr., Professor of Acquisition/Program Management, Research Directorate, DSMC, Fort Belvoir, VA, June 1982.

APPENDIX E

DEFINITION OF TERMS

Most terms applicable to single service acquisition management are also applicable to joint service acquisition management. The glossary included in, "The Program Manager's Notebook," (prepared and published by the Defense Systems Management College (DSMC), October 1985) contains an extensive listing of acquisition management terms and their definitions. Accordingly, this appendix only contains terms and definitions which are either applicable only to joint programs, or other relevant terms that were not included in the glossary cited above.

ACQUISITION/MANUFACTURING STRATEGY
The approach to obtaining the total quantity of a system at some rate for some cost.

ACQUISITION STREAMLINING
Any action that results in more efficient and effective use of resources to develop, produce, and deploy quality defense systems and products. This includes ensuring that only cost-effective requirements are included, at the most appropriate time, in system and equipment solicitations and contracts.

APPLICATION
The process of selecting requirements that are pertinent and cost effective for the particular material acquisition and contractually invoking them at the most advantageous times in the acquisition cycle.

BASELINE COMPARISON SYSTEM (BCS)
A current operational system, or a composite of current operational subsystems, which most closely represents the design, operational, and support characteristics of the new system under development.

BASELINING
A process whereby all managers concerned collectively agree on the specific description of the program, requirements, and funding, and make a commitment to manage the program along those guidelines.

COMPARABILITY ANALYSIS
An examination of two or more systems and their relationships to discover resemblances or differences.

CONTRACT REQUIREMENTS
In addition to specified performance requirements, contract requirements include those defined in the Statement of Work (SOW); specifications, standards and related documents; the Contract Data Requirements List (CDRL); management systems; and contract terms and conditions.

CONSTRAINTS
Restrictions or boundary conditions that impact overall capability, priority, and resources in system acquisition.

COST CAP
The maximum total dollar amount the Department of Defense is willing to commit for acquiring a given capability. A cost cap consists of program acquisition costs only and is maintained in constant dollars. Cost caps are applied to selected baseline programs.

DEFENSE ACQUISITION BOARD (DAB)
The Defense Acquisition Board (DAB) was established in the early part of 1987 to replace the Joint Requirements and Management Board (JRMB) and its predecessor, the Defense Systems Acquisition Review Council (DSARC). The DAB, like the JRMB and the DSARC, is responsible for reviewing major acquisition programs at designated milestones

and appraising the Secretary of Defense of the program status and readiness to proceed to the next phase in the acquisition process, as well as other issues determined to be necessary. The Under Secretary of Defense (Acquisition) USD(A) chairs the DAB. Currently, a DAB Charter is being staffed that will delineate its responsibilities more definitely.

DESIGN INTERFACE
The relationship of logistics-related design parameters, such as R&M, to readiness and support resource requirements. These logistics-related design parameters are expressed in operational terms rather than as inherent values and specifically relate to system readiness objectives and support costs of the materiel system, one of the principal elements of ILS.

DESIGN TO GOALS
Desirable design parameters for a system.

EVALUATION CRITERIA
Standards by which achievement of required operational effectiveness/ suitability characteristics, or resolution of technical or operational issues, may be judged. At Milestone II and beyond, evaluation criteria must include quantitative goals (the desired value) and thresholds (the value beyond which the characteristic is unsatisfactory.)

EXECUTIVE SERVICE
See Lead Service."

FAST TRACK PROGRAM
An acquisition program in which time constraints require the design, development, production, testing, and support acquisition processes to be compressed or overlapped.

FUNDING PROFILE
A tabulation of R&D and Production dollars using a span of years and several criteria to establish a financial picture of the program.

JOINT ACQUISITION PROGRAM
A directed joint effort for the development and procurement of systems, subsystems, equipment, software, or munitions as well as supporting equipment or systems, with the goal of providing a new or improved capability for a validated joint need. Certain modification programs may be included when they are determined to be of significant interest or priority to the participating services. (Also see Joint Program.)

JOINT INTEGRATED LOGISTICS SUPPORT PLANS (JILSP)
A program document, prepared by the lead service in coordination with the participating services, is objective-oriented at the start and gradually becomes task- and schedule-specific as the acquisition process gains momentum.

JOINT OPERATING PROCEDURES (JOPs)
These documents should identify and describe detailed procedures and interactions necessary to carry out significant aspects of a joint program. Subjects for JOPs may include Systems Engineering, Personnel Staffing, Reliability, Survivability, Vulnerability, Maintainability, Production, Management Controls and Reporting (including SAR), Financial Control, Test and Evaluation, Training, Logistics Support, Procurement and Deployment. The JOPs are developed and negotiated by the Program Manager and the participating Services.

JOINT PROGRAM
A joint program is one in which two or more services are participating in the development and acquisition of a weapon system. In such a program, the services may ultimately buy the same item or variants of an item to reflect service-specific needs, missions, and requirements.

JOINT PROGRAM CHARTER/ PROGRAM MANAGER'S CHARTER
A formal document prepared by the lead service through negotiations and approval of the participating services which delineates the Program Manager's mission responsibility, authority and major functions, and describes his relationships with other organizations which will use and/or support the Program. The Charter describes and assigns responsibility for satisfying peculiar management requirements of participating services which are to be met in the program, and will be jointly approved for the headquarters of each involved service by persons officially appointed to approve such Charters.

JOINT REQUIREMENTS OVERSIGHT COUNCIL (JROC)
The Joint Requirements Oversight Council (JROC) was chartered in 1984. Under the direction of the Joint Chiefs of Staff (JCS), the JROC is tasked with: examining potential joint military requirements; identifying, evaluating, and selecting candidates for joint development and acquisition programs; providing oversight of cross-service requirements and management issues; and resolving service issues that arise after a joint program has been initiated.

JOINT SERVICES OPERATIONAL REQUIREMENT (JSOR)
A document that describes the threat vulnerability and technical requirements of a system.

LEAD SERVICE
The service that is designated to assume the authority and responsibility for managing the joint program by assigning a program manager initiating the program charter, and acts as the principal coordinator of inter-service relationships. (Same as Executive Service.)

MAJOR SYSTEM/PROGRAM
A system/program that meets one of the following criteria for jointness: is a SAR program; of significant interest to OSD or Congress; an RDT&E program that is greater than $200 million and has all its components; or has procurement cost dollars greater than $1 billion (both in FY80 dollars), and also has all its components. The Executive Secretary of the DAB periodically updates and distributes a list of currently designated OSD major system acquisition programs.

MEMORANDUM OF AGREEMENT (MOA)
An agreement between Services specifying commitments, responsibilities and mutual objectives. In the context of joint program such agreements address a variety of critical programmatic issues such as management practices, cost sharing arrangements, etc.

MEMORANDUM OF UNDERSTANDING (MOU)
An agreement usually among nations very similar in purpose to Memorandum of Agreement (MOA). A Memorandum of Understanding may express a mutual understanding of an issue without implying commitments by parties to the understanding.

MULTISERVICE CHARTER/ PROGRAM MANAGER'S CHARTER
See Joint Program Charter/Program Manager's Charter.

NAVY PROGRAM DECISION MEETING (NPDM)
The Navy Program Decision Meeting (NPDM) has been established by the Navy and has the same responsibilities, functions and tasks as its predecessor, the Department of the Navy Systems Acquisition Review Council (DNSARC).

NON-MAJOR SYSTEM
A full system that does not qualify as a major system, or performs a major function of a complete system that is ei-

ther within a major or another non-major system.

OPERATIONAL EFFECTIVENESS
The overall degree of mission accomplishment of a system used by representative personnel in the context of the organization, doctrine, tactics, threat (including countermeasures and nuclear threats), and environment in the planned operational employment of the system.

OPERATIONAL REQUIREMENTS
User or user representative generated validated needs developed to address mission area deficiencies, evolving threats, emerging technologies or weapon system cost improvements. Operational requirements form the foundation for weapon system unique specifications and contract requirements.

OPERATIONAL SUITABILITY
The degree to which a system can be placed satisfactorily in field use, with consideration being given to availability, compatibility, transportability, interoperability, reliability, wartime usage rates, maintainability, safety, human factors, manpower supportability, logistic supportability, and training requirements.

PARTICIPATING SERVICE
An organization that supports the lead service in the development of a program by its contribution of personnel and/or funds for the successful completion of the program.

PROGRAM BASELINE AGREEMENT
A program baseline document signed by the Program Manager (PM), the Service Acquisition Executive (SAE), and the Defense Acquisition Executive (DAE).

PROGRAM CHARTER/PROGRAM MANAGER'S CHARTER
See Joint Program Charter/Program Manager's Charter.

PROGRAM INSTABILITY
The condition imposed on a program due to problems in requirements, technology, and funding.

PROGRAM MASTER PLAN
A document developed and issued by the Program Manager which presents the integrated time-phased tasks and resources required to accomplish the tasks specified in the approved statement of need/performance requirements. The plan should be jointly approved for each participating service by persons officially appointed to approve such plans.

SECOND SOURCE
Execution of acquisition strategy to establish two producers for a part or system.

SOURCE OF JOINTNESS
The authority that determines the establishment of a joint program, be it internal (within the Service itself) or external (by the OSD or Congress).

STAFFING
A statement of authorized personnel strength in a program office.

SUPPORTING SERVICE
A Service designated by the Secretary of Defense, or as the result of Service Initiatives, to assist the designated lead Service in the management of a Multiservice Operational Test and Evaluation (MOT&E) or Joint Test and Evaluation (JT&E) program.

SYSTEM ENGINEERING
The application of scientific and engineering efforts to (1) transform an operational need into a description of a system configuration which best satisfies the operational need according to the measures of effectiveness; (2) integrate related technical parameters and assure compatibility of all physical, functional and technical program interfaces in a manner which optimizes the total system definition and design; (3) integrate the

efforts of all engineering disciplines and specialties into the total engineering effort.

SYSTEM ENGINEERING PROCESS
The iterative, logical sequence of analysis, design, test and decision activities that transforms an operational need into the descriptions required for production and fielding of all operational and support system elements.

TAILORING (JOINT PROGRAMS)
The process of evaluating potential requirements of the participating services to determine their pertinence and cost effectiveness for a specific system or equipment joint acquisition, and modifying these requirements to ensure that each contributes to an optimal balance between the needs of the participating services and cost.

WITHDRAWAL
The action taken by a service to remove its resources of personnel and funds from a Joint Program before the program is completed.

APPENDIX F
LIST OF JOINT SERVICE PROGRAMS
(Current as of November 1986)

PROGRAM/PROJECT TITLE	PROGRAM OFFICE & LOCATION	LEAD SERVICE(S)	PARTICIPATING SERVICE(S)	CURRENT ACQUISITION PHASE	CLASSIFICATION TYPE *
SECTION 1-LEAD SERVICE: OSD					
Joint Interoperability of Tactical C^2 Systems (JINTACCS)	Director, JTC3A Fort Monmouth, NJ	OSD	Army, Navy, AF, Marine	N/A	M-2
SECTION 2-LEAD SERVICE: AIR FORCE					
Advanced Medium Range Air-to-Air Missile (AMRAAM)	Armament Division/YM Eglin AFB, FL	Air Force	Navy	Full Scale Development	S-6 (ACAT I)
Advanced Tactical Air Reconnaisance System (ATARS)	ASD/RW Wright-Patterson AFB, OH	Air Force	Navy	Full Scale Development	S-6 (ACAT I)
Air Force Satellite Communication System (AFSATCOM)	Space Division/YKA Los Angeles AFS, CA	Air Force	Army/Navy	Production	S-2
Base & Installation Security Systems (BISS)	ESD, Hanscom AFB, MA	Air Force	Army/Navy	Production	M-2
COBRA JUDY	ESD, Hanscom AFB, MA	Air Force	Army/Navy	Production	M-1
Combat ID System	ASD/XRQI Wright-Patterson AFB, OH	Air Force	Army/Navy	Concept Exploration	S-6 (ACAT I)
Combat Identification Systems (CIS)(MKXV)	ASD Wright-Patterson AFB, OH	Air Force	Army/Navy	Demonstration/ Validation	S-3
CONUS-OTH Radar	ESD, Hanscom AFB	Air Force	Navy	Production	S-4
Defense Meteorological Satellite Program (DMSP)	Space Division/YD Los Angeles AFS, CA	Air Force	Navy	Production	S-2

* See Table 1-1 for descriptions

LIST OF JOINT SERVICE PROGRAMS
(Continued)

PROGRAM/PROJECT TITLE	PROGRAM OFFICE & LOCATION	LEAD SERVICE(S)	PARTICIPATING SERVICE(S)	CURRENT ACQUISITION PHASE	CLASSIFICATION TYPE
SECTION 2-LEAD SERVICE: AIR FORCE (Continued)					
Defense Support Program (DSP) (Satellite System)	Space Division/YG Los Angeles AFS, CA	Air Force	Navy	Production	S-2
Digital European Backbone (DEB)	ESD, Hansom AFB, MA	Air Force	Army/Navy	Production/ Deployment	S-3
E-3A	ESD, Hanscom AFB, MA	Air Force	Navy	Inventory	M-5
GATOR Anti-Tank & Anti-Personnel	ALC, Hill AFB, UT ARDEC Dover, NJ NAVAIRSYSCOM Washington, DC	Air Force	Navy/Army	Production/ Deployment	M-1
HAVE QUICK	ESD, Hanscom AFB, MA	Air Force	Navy	Have Quick II Production	S-2
Hypervelocity Missile	Armament Division Eglin AFB, FL	Air Force	Army/ Marine Corps	Concept Exploration	S-3 (ACAT I)
Integrated Electronic Warfare System (INEWS)	ASD Wright-Patterson AFB, OH	Air Force	Navy	Concept Exploration	S-5
Inter-Service/Agency Automated Message Processing Exchange (I-S/A AMPE)	Switch Systems Fort Monmouth, NJ	Air Force	DCA/Army/Navy/ Marine Corps	Concept Exploration	S-3
Interim Operational Nuclear Detection System (IONDS)	Space Division, YG Los Angeles AFS, CA	Air Force	Navy	Production	S-2

LIST OF JOINT SERVICE PROGRAMS
(Continued)

PROGRAM/PROJECT TITLE	PROGRAM OFFICE & LOCATION	LEAD SERVICE(S)	PARTICIPATING SERVICE(S)	CURRENT ACQUISITION PHASE	CLASSIFICATION TYPE
SECTION 2-LEAD SERVICE: AIR FORCE (Continued)					
Joint Surveillance & Target-Attack Radar System (JSTARS)	ESD, Hanscom AFB, MA	Air Force	Army	Full Scale Development	S-6
Joint Tactical Information Distribution System (JTIDS)	ESD, Hanscom AFB, MA	Air Force	Navy/Army/ Marine Corps	Full Scale Development	S-6
Life Support Systems	ASD/AES Wright-Patterson AFB, OH	Air Force/Army/ Navy	Army/Navy	Development/ Production	M-1
MAVERICK (LASER) (IIR) Air-Ground Missile (AGM-65)	ASD/TAM Wright-Patterson AFB, OH	Air Force	Navy/Marine Corps	Production	S-6
Mobile Tactical Shelters	ESD/OCR, Hanscom AFB, MA	Air Force/Army	Army, Navy/ Marine Corps	Production/ Deployment	M-4
Modular Automatic Test Equipment (MATE) System	ASD/AEGB Wright-Patterson AFB, OH	Air Force	Navy/Army	Development/ Production	S-3
NAVSTAR Global Positioning System (GPS)	Space Division YE Los Angeles AFS, CA	Air Force	Army/Navy/NATO/ DOT/DMA/ Marine Corps	Low Rate Initial Production	S-6 (ACAT I)
Range Improvement Air Combat Maneuvering Instrumentation (ACMI)	Armament Division Eglin AFB, FL	Air Force	Navy	Production/ Deployment	M-4
Safe Programs	ESD, Hanscom AFB, MA	Air Force	Army(Minimal)	Procurement/ Deployment	M-4

LIST OF JOINT SERVICE PROGRAMS
(Continued)

PROGRAM/PROJECT TITLE	PROGRAM OFFICE & LOCATION	LEAD SERVICE(S)	PARTICIPATING SERVICE(S)	CURRENT ACQUISITION PHASE	CLASSIFICATION TYPE
SECTION 2-LEAD SERVICE: AIR FORCE (Continued)					
Satellite Data Systems	Space Division/YR Los Angeles AFS, CA	Air Force	Army/Navy	Phase Out	S-2
Space Boosters/Space Support Program (Launch Vehicles)	Space Division/YV Los Angeles AFS, CA	Air Force	Navy	Production	S-2
Space Defense & Operations/Anti-Satellite Missile System (ASAT)	Space Division/YN Los Angeles AFS, CA	Air Force	Navy	Full Scale Development	S-2
Space Shuttle (DOD Use/Upper Stage Acquisition)(Reusable Orbiter)	Space Division/YV Los Angeles AFS, CA	Air Force	NASA/Navy	Full Scale Development	S-2
Space Test Program	Space Division/YV Los Angeles AFS, CA	Air Force	Army/Navy	Full Scale Development	M-3
Space Track (ALTAIR MOD)	Space Division/YNC Los Angeles AFS, CA	Air Force	Army	System Upgrade Modification	M-4
Support Equipment	ASD/AEG, Wright-Patterson AFB, OH	Air Force/Army	Army/Navy	Incremental Development & Production	M-5
TACIT RAINBOW	ASD/TA Wright-Patterson AFB, OH	Air Force	Navy	Full Scale Development	S-6 (ACAT I)
Tactical Air Control System Improvement (TACSI) Program	ESD, Hanscom AFB, MA	Air Force	Marine Corps	Production	S-2

LIST OF JOINT SERVICE PROGRAMS
(Continued)

PROGRAM/PROJECT TITLE	PROGRAM OFFICE & LOCATION	LEAD SERVICE(S)	PARTICIPATING SERVICE(S)	CURRENT ACQUISITION PHASE	CLASSIFICATION TYPE
SECTION 2-LEAD SERVICE: AIR FORCE (Continued)					
TRI-TAC Joint Tactical Communications Program	DOD TRI-TAC Office Fort Monmouth, NJ	Air Force/Army	Navy/Marine Corps	Production	M-2
WWMCCS Information System (WIS)	JPMO-WIS, McLean, VA	Air Force	Army/Navy	Incremental Development & Production	S-6 (ACAT I)
SECTION 3-LEAD SERVICE: ARMY					
AAWS-M	USA MICOM Redstone Arsenal, AL	Army	Marine Corps	Technical Demonstration	S-2 (ACAT I)
Chemical Warfare and Chemical Biological Defense Research and Development	Deputy Chief of Staff for Chemical and Nuclear Matters AMC Alexandria, VA	Army	Air Force/Navy/ Marine Corps	Concept Exploration	S-2
Commercial Utility and Cargo Vehicle (CUCV)	PM for Light Tactical Vehicles TACOM, Warren, MI	Army	Air Force/Navy Marine Corps	Production	M-1
COPPERHEAD	PM CAWS Picatinny Arsenal, NJ	Army	Navy/Marine Corps	Production	S-4

LIST OF JOINT SERVICE PROGRAMS
(Continued)

PROGRAM/PROJECT TITLE	PROGRAM OFFICE & LOCATION	LEAD SERVICE(S)	PARTICIPATING SERVICE(S)	CURRENT ACQUISITION PHASE	CLASSIFICATION TYPE
SECTION 3-LEAD SERVICE: ARMY (Continued)					
Defense Satellite Communication System (DSCS)(Ground Environment)	USA Satellite Communications Agency Fort Monmouth, NJ	Army	Air Force/Navy DCA	70 Contracts in this Contract are at Multiple Phases	S-3
DOD Family of Military Standard Generators	PM for Mobile Electric Power Ft. Belvoir, VA	Army	Air Force/Navy/ Marine Corps	Incremental Development & Production	M-1
DOD Food and Nutrition Research, Development, Test, Evaluation and Engineering (RDTE&E) PGM	Executive Secretary, DOD Food and Nutrition RDTE&E Program NRDEC Natick, MA	Army	Air Force/Navy Marine Corps	RDT&E	S-2
Family of Medium Tactical Vehicles (FMTV)	PM for Medium Tactical Vehicles TACOM, Warren, MI	Army	Air Force/ Marine Corps	RDT&E	S-2
Ground Mobile Forces Communications System (GFMCS)	USA Satellite Communications Agency Ft. Monmouth, NJ	Army	Air Force/Navy/ Marine Corps/DCA	Multiple Contracts in Various Phases	S-3
HAWK	USA MICOM Redstone Arsenal, AL	Army	Marine Corps	Production Product Improvement Package	S-2
High-Mobility Multi-Purpose Wheeled Vehicle (HMMWV)	PM for Light Tactical Vehicles TACOM, Warren, NJ	Army	Air Force/ Marine Corps	Production	M-1

LIST OF JOINT SERVICE PROGRAMS
(Continued)

PROGRAM/PROJECT TITLE	PROGRAM OFFICE & LOCATION	LEAD SERVICE(S)	PARTICIPATING SERVICE(S)	CURRENT ACQUISITION PHASE	CLASSIFICATION TYPE
SECTION 3-LEAD SERVICE: ARMY (Continued)					
Joint Tactical Fusion Program (JTFP)	PM, Joint Tactical Fusion Program McLean, VA	Army	Air Force	Full Scale Development	S-5
Lightweight Multi-Purpose Weapon, AT4 (NDI JTPE ITEM)	PM AMWS MICOM Redstone Arsenal, AL	Army	Navy/Marine Corps	Procurement 2nd YR	S-2
M1A1 (120 MM Gun)	Tank Automotive Center, Warren, MI	Army	Marine Corps	Production	S-4
Nuclear Munitions	PM NUC Munitions Dover, NJ	Army	Air Force/Navy/ Marine Corps	Engineering Development, and Full Scale Development	S-2
Position Location & Reporting System (PLRS)	PM, PLRS-TIDS Ft. Monmouth, NJ	Army	Marine Corps	Production	S-6
Regency Net	USA Regency Net Ft. Monmouth, NJ	Army	Air Force/Navy	Latter Phase of Non-Development Item Procurement	S-3
Sense and Destroy Armor (SADARM)	PM CAWS Picatinny Arsenal, NJ	Army	Navy/Marine Corps	Engineering Development	S-4
Smoke and Obscurants	PM for Smoke and Obscurants Aberdeen, MD	Army	Marine Corps	Incremental Development & Production	M-1

LIST OF JOINT SERVICE PROGRAMS
(Continued)

PROGRAM/PROJECT TITLE	PROGRAM OFFICE & LOCATION	LEAD SERVICE(S)	PARTICIPATING SERVICE(S)	CURRENT ACQUISITION PHASE	CLASSIFICATION TYPE
SECTION 3-LEAD SERVICE: ARMY (Continued)					
STINGER	USA MICOM Redstone Arsenal, AL	Army	Air Force/Navy/ Marine Corps	Milestone III	S-2
Tactical Satellite Communications (TACSATCOM/SCOTT)	USA Satellite Communications Agency Ft Monmouth, NJ	Army	Air Force/Navy/ Marine Corps/JCS	Full Scale Development	S-4
Tube Launched, Optically-Tracked, Wire-Guided (TOW) Missile	USA MICOM Redstone Arsenal, AL	Army	Marine Corps	Production Product Improvement Package (Warhead)	S-2
TRI-TAC Joint Tactical Communication Systems	PM, Multi-Service Communication Systems (MSCS) Ft. Monmouth, NJ	Army	Air Force/Navy/ Marine Corps	Production	S-3
Volcano	PM Mines Countermine and Demolitions ARDEC Picatinny Arsenal, NJ	Army	Marine Corps	Advanced Development Milestone II In-Progress/Process Review	S-2
Water Supply Equipment	PM for Petroleum and Water Logistics TROSCOM, St. Louis, MO	Army	Air Force/ Marine Corps	RDT&E and Production	S-2
XM762 Electronic Time Arty Fuze	PM CAWS ARDEC Picatinny Arsenal, NJ	Army	Navy/Marine Corps	Advanced Development	S-3

LIST OF JOINT SERVICE PROGRAMS
(Continued)

PROGRAM/PROJECT TITLE	PROGRAM OFFICE & LOCATION	LEAD SERVICE(S)	PARTICIPATING SERVICE(S)	CURRENT ACQUISITION PHASE	CLASSIFICATION TYPE
SECTION 3-LEAD SERVICE: ARMY (Continued)					
5-Ton Truck	PM for Medium Tactical Vehicles TACOM, Warren, MI	Army	Air Force/Navy/ Marine Corps	Production	M-1
SECTION 4-LEAD SERVICE: NAVY					
Advanced Tactical Aircraft Protection Systems (ATAPS/ ASPJ)	NAVAIRSYSCOM (PMA-272) Washington, DC	Navy	Air Force	Milestone IIIA	S-6 (ACAT I)
Active Inert Missile (AIM-7F/M)	NAVAIRSYSCOM (PMA-259) Washington, DC	Navy	Air Force	Production	S-6
Active Inert Missile (AIM-9J/M)	NAVAIRSYSCOM (PMA-259) Washington, DC	Navy	Air Force	Production	S-6
Air/Ground/Sea Launched Cruise Missile, ALCM/GLCM/SLCM	JCMPO Washington, DC	Navy	Air Force	Various	S-6
BIGEYE Weapon System	NAVAIRSYSCON (APC-201) Washington, DC Munitions SPO Eglin AFB, FL	Navy	Air Force	Milestone IIIA	S-3

LIST OF JOINT SERVICE PROGRAMS
(Continued)

PROGRAM/PROJECT TITLE	PROGRAM OFFICE & LOCATION	LEAD SERVICE(S)	PARTICIPATING SERVICE(S)	CURRENT ACQUISITION PHASE	CLASSIFICATION TYPE
SECTION 4-LEAD SERVICE: NAVY (Continued)					
FLTSATCOM	SPAWARSYSCOM Washington, DC	Navy	Air Force	Full Scale Development (Milestone III next)	M-4
FMU-139/B Bomb Fuze	NAVAIRSYSCOM (APC-201) Washington, DC Munitions SPO (SD-3) Eglin AFB, FL	Navy	Air Force	Initial Production	S-6
Fuel Air Explosive (FAE II)	NAVAIRSYSCOM (AIR-5401) Washington, DC Munition SPO (SD-3) Eglin AFB, FL	Navy	Air Force	Production	S-6
High Speed Anti-Radiation Missile/Low Cost Seeker (HARM/LCS)	NAVAIRSYSCOM (PMA-242) Washington, DC	Navy	Air Force	Milestone II	S-6
RF Jammer (ALQ-162)	NAVAIRSYSCOM (PMA-253) Washington, DC	Navy	Army/Marine Corps	Milestone IIIB	S-6 (ACAT I)
V-22 OSPREY (Joint Vertical Lift Aircraft)	NAVAIRSYSCOM (PMA-275) Washington, DC	Navy	Air Force/ Army	Full Scale Development	S-6 (ACAT I)

LIST OF JOINT SERVICE PROGRAMS
(Continued)

PROGRAM/PROJECT TITLE	PROGRAM OFFICE & LOCATION	LEAD SERVICE(S)	PARTICIPATING SERVICE(S)	CURRENT ACQUISITION PHASE	CLASSIFICATION TYPE
SECTION 5-LEAD SERVICE: OTHER					
Defense Satellite Communication System (DSCS)	DCA (B400) Washington, DC	DCA	Air Force/Army/ Navy	Production	M-2
Defense Satellite Communication System (DSCS) Satellite	Space Division/YH Los Angeles, CA	Air Force	Army/Navy	Production	M-1
Defense Satellite Communication System (DSCS) Ground Entry	SATCOMA Fort Monmouth, NJ	Army	Air Force/Navy	Production	M-1
Defense Satellite Communication System (DSCS) Control	DCA (B400) Washington, DC	Army	Air Force/Navy	Production	M-1
DROPSONDE (Expendable Sensor for IWRS)	NOAA/NCAR Rockville, MD	NOAA	Air Force/Navy	Research & Development	S-5
Improved Weather Reconnaisance System (IWRS)	OFCM Rockville, MD	OFCM	Air Force/NOAA	Validation	S-5
Next Generation Weather Radar (NEXRAD)	NWS Washington, DC	NOAA/NWS	Air Force/Navy/ FAA	Validation	S-6
Profiler	NOAA Boulder, CO	NOAA	Air Force/OFCM	Validation (Prototype)	S-5

Comment Sheet
for

JOINT LOGISTICS COMMANDER'S GUIDE
for the Management of Joint Service Programs
3rd Edition - 1987

This guide was prepared as a reference document for program management personnel. Because of the dynamic nature of the entire acquisition environment, revisions and updates to this guide are expected to be necessary. Your comments and suggestions are solicited.

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